Preliminary Look at Current-Practices Scenario Run “C305”

ESHMC 11 May 2007

B. Contor

Background

- Uniform stress representing best estimate of current practices with average hydrologic conditions
- Six different input data sets give range of uncertainty associated with input data
- Needs to be re-run (slight adjustment of Aberdeen-Springfield returns)

Input data sets

- D10: Dual-index selection (Heise natural flow w/antecedent-condition consideration and temperature at Aberdeen), 10-year candidate pool
- D15: Dual-index selection, 15-year candidate pool
- H10: Heise natural flow w/ antecedent condition, 10-year candidate pool

Input data sets

- H15: Heise natural flow w/ antecedent condition, 15-year candidate pool
- P10: Palmer Drought Index, 10-year candidate pool
- P15: Palmer Drought Index, 15-year candidate pool

Overview

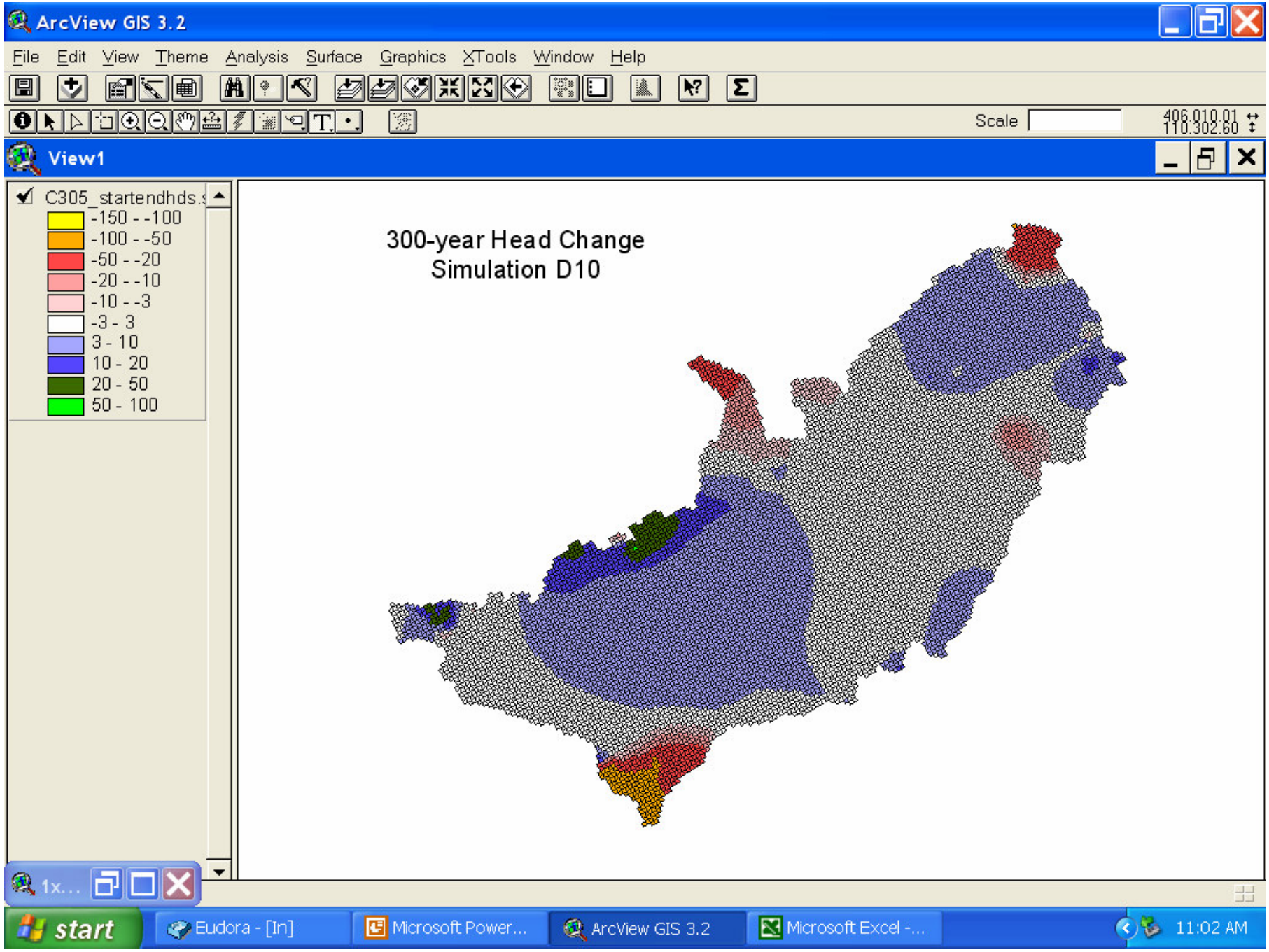
- Startup issues: Spring-time water levels are not season average, but stress is an average stress. Implication: Part of observed adjustment may be *seasonal* and not *change in general condition*
  - Effort to adjust by running extended data set w/ annual stress but some residual effect may be still represented
- Most simulations show improvement; some show worsening

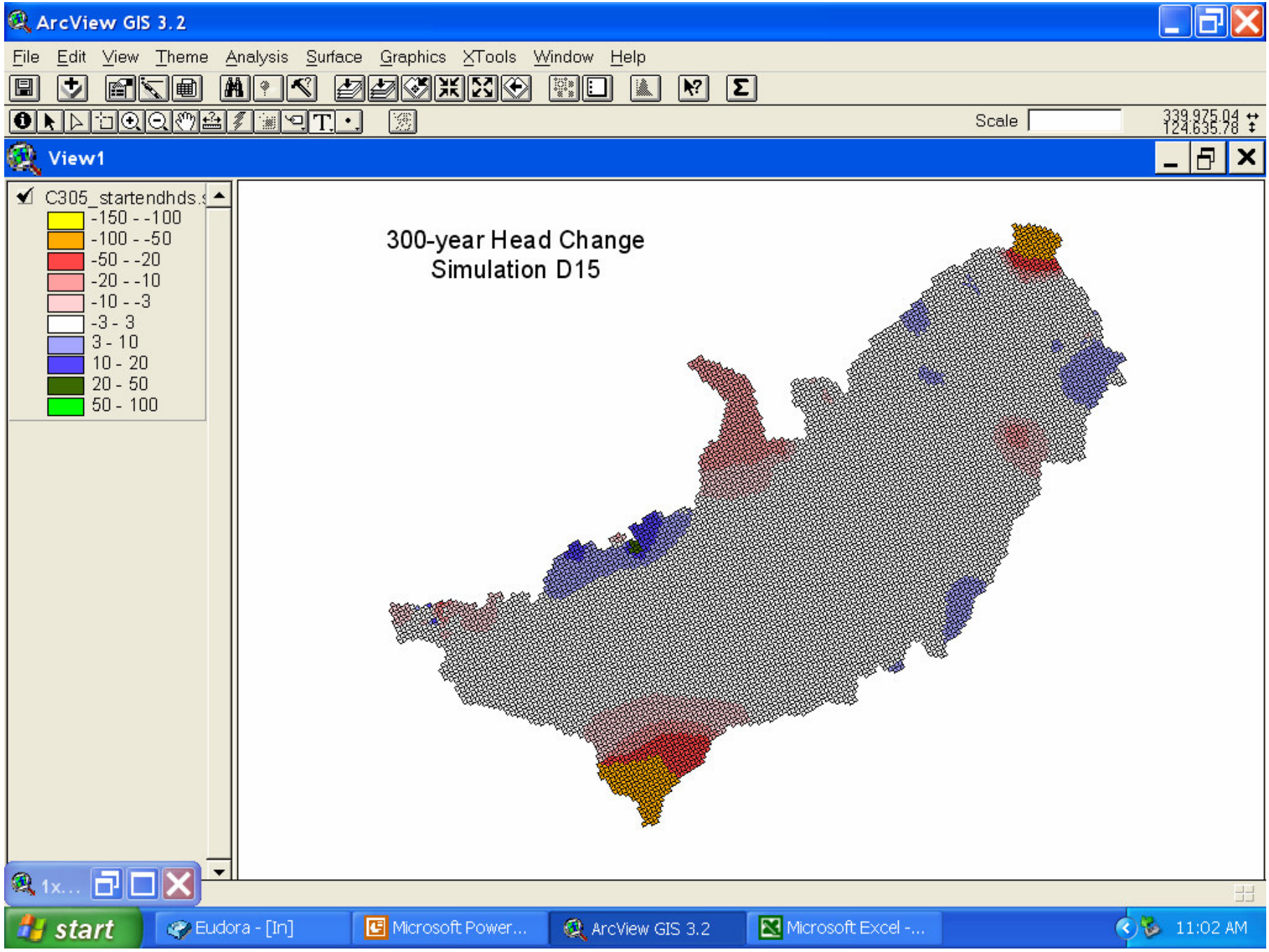
Overview

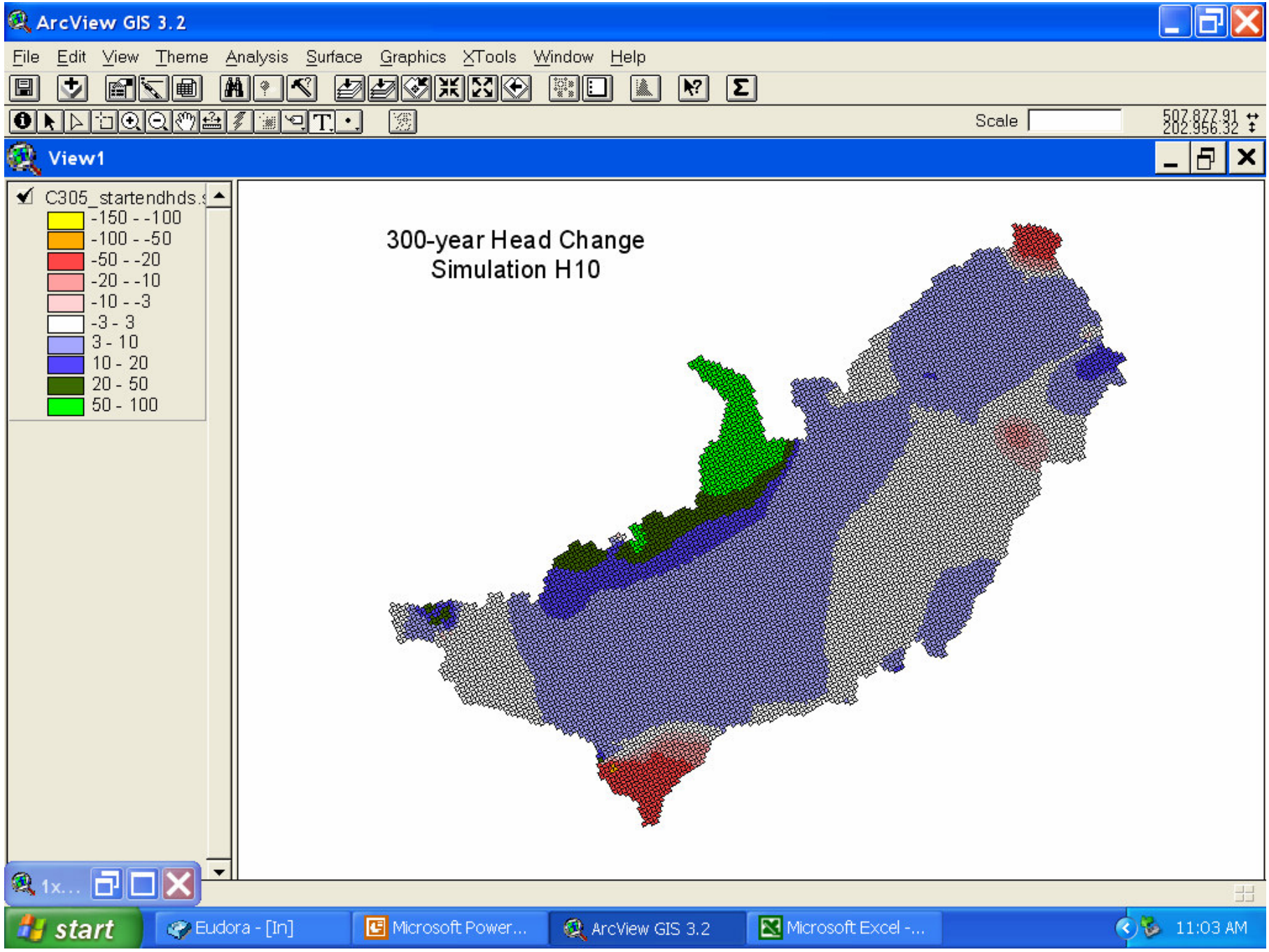
- Some significant head changes distant from river
- Most gain/loss/discharge changes are small

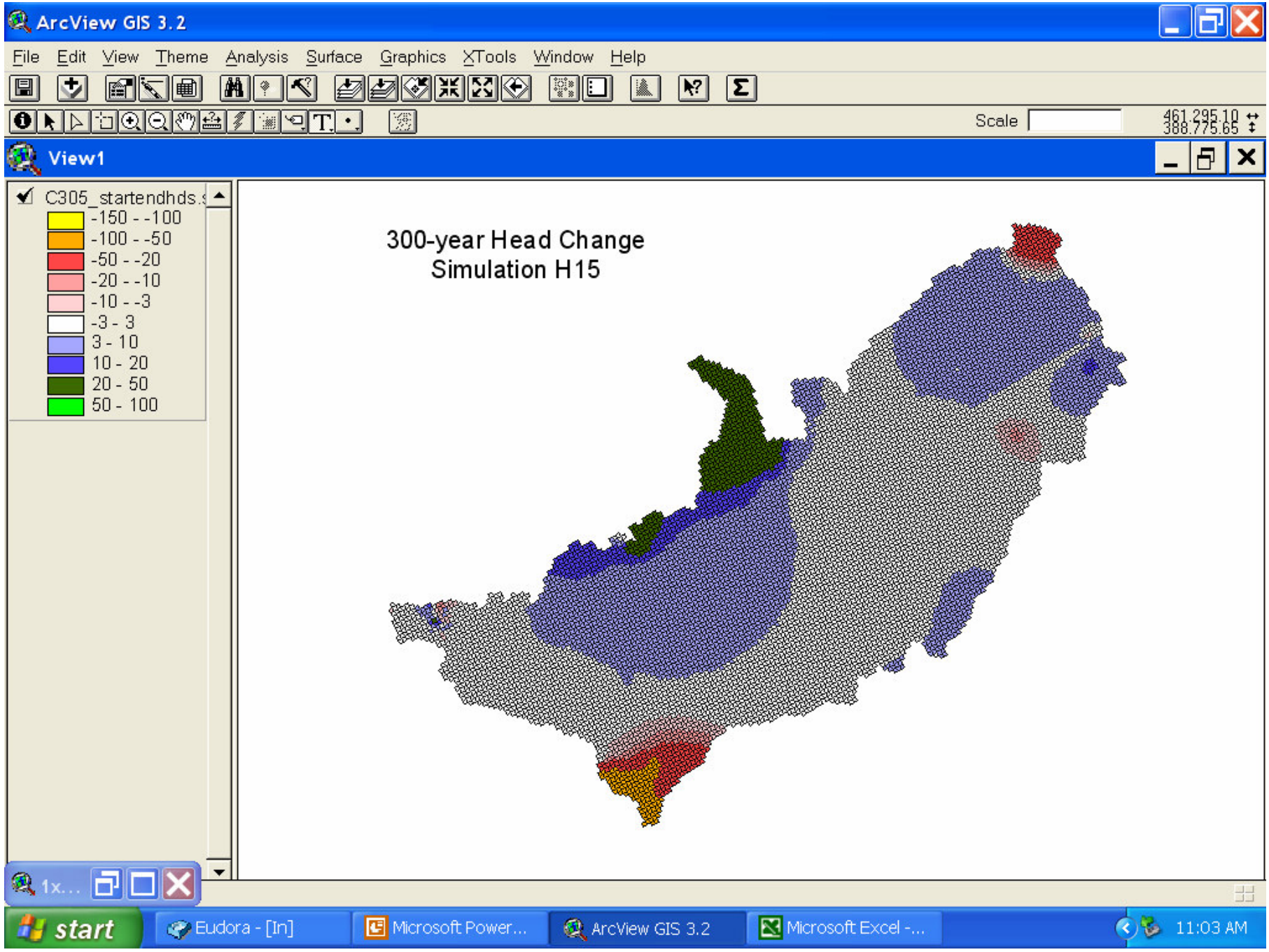
1. Head Results – C305

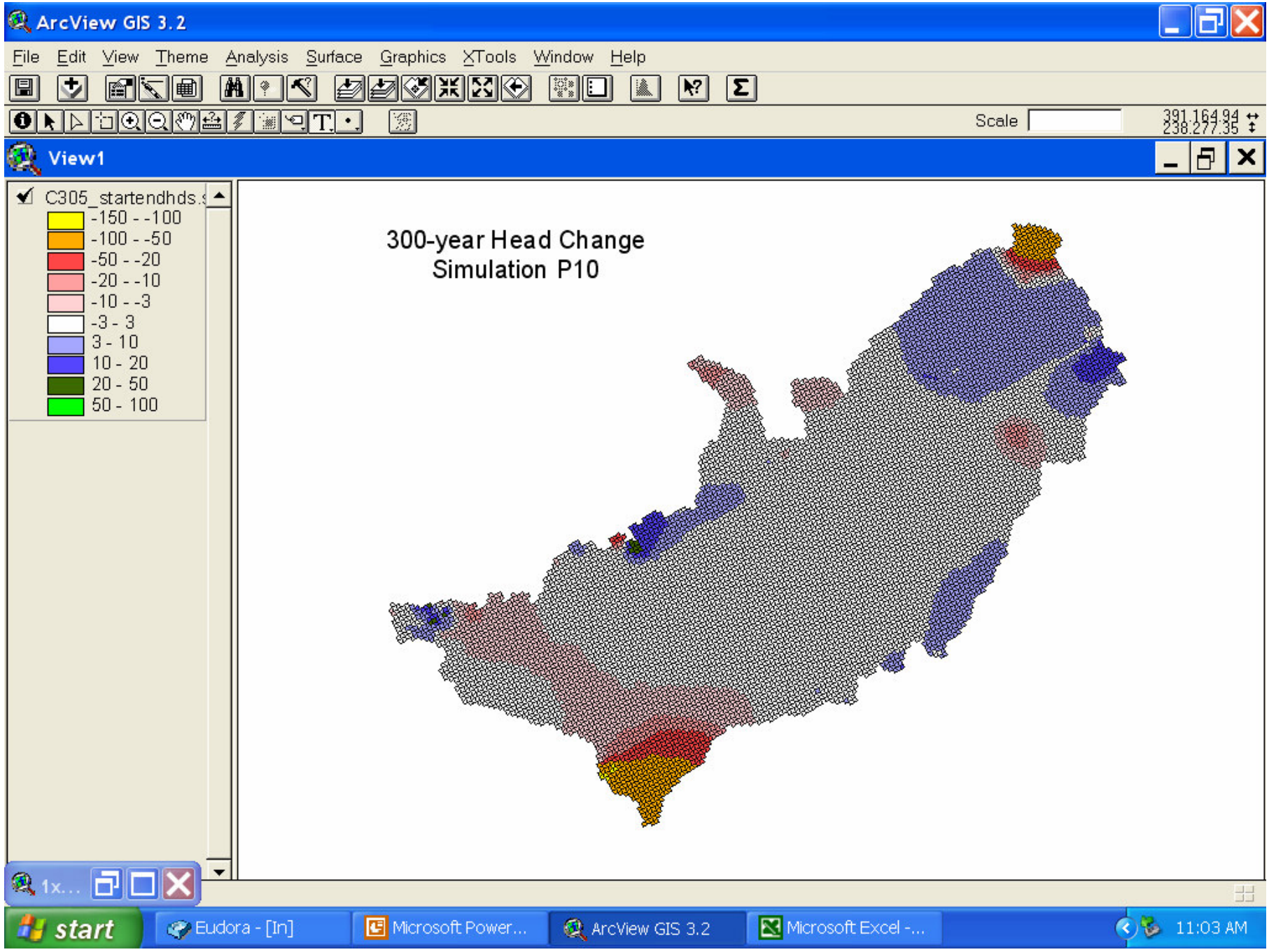
- Change maps are change from 1 May 2007 to 1 May 2307 (300 years)
- Following the change maps are hydrographs.

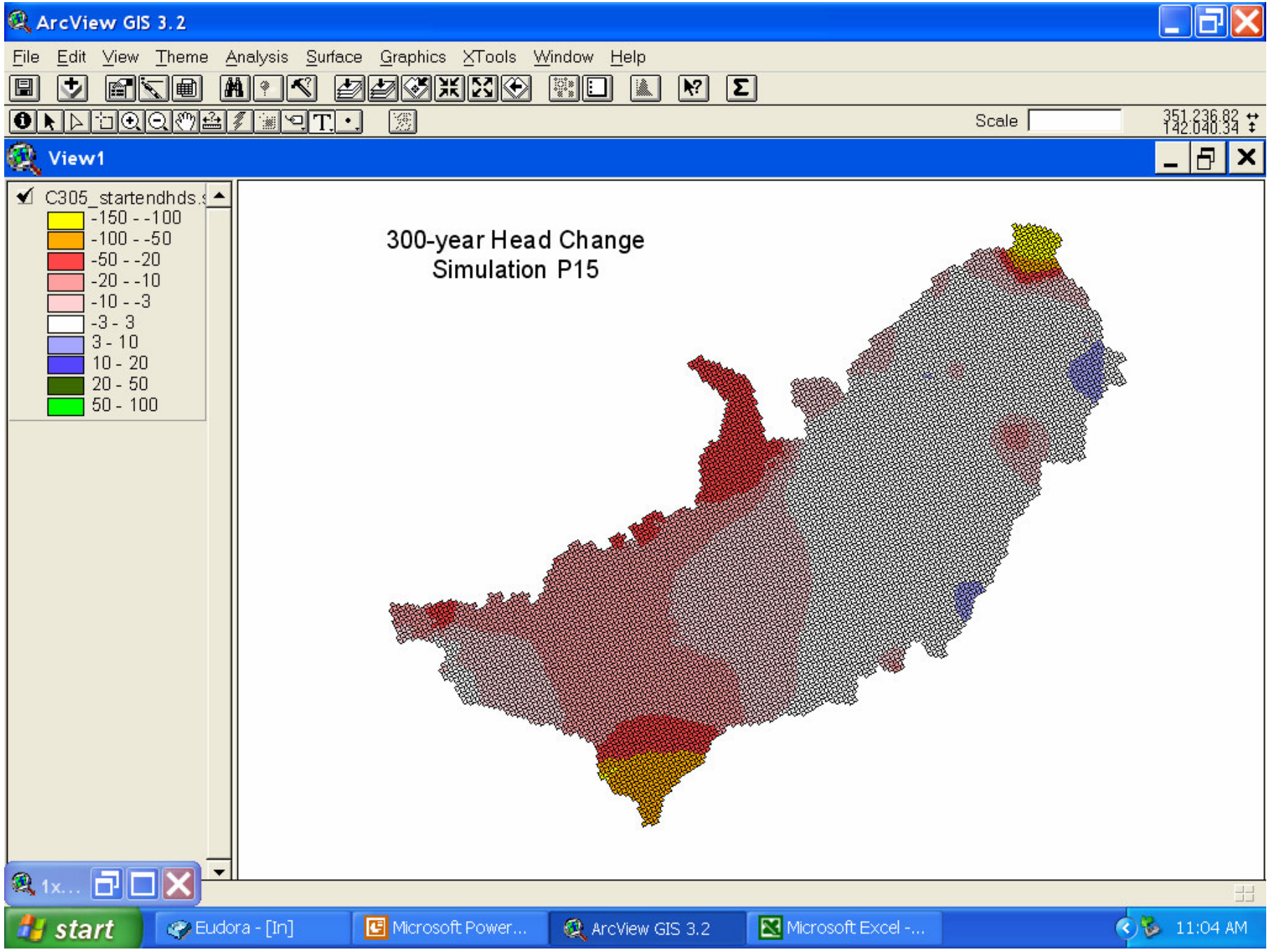

ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics XTools Window Help
Scale
View1
C305_startendhds.s
-150 - -100
-100 - -50
-50 - -20
-20 - -10
-10 - -3
-3 - 3
3 - 10
10 - 20
20 - 50
50 - 100
300-year Head Change
Simulation D10
start
Eudora - [In]
Microsoft Power...
ArcView GIS 3.2
Microsoft Excel -...
11:02 AM

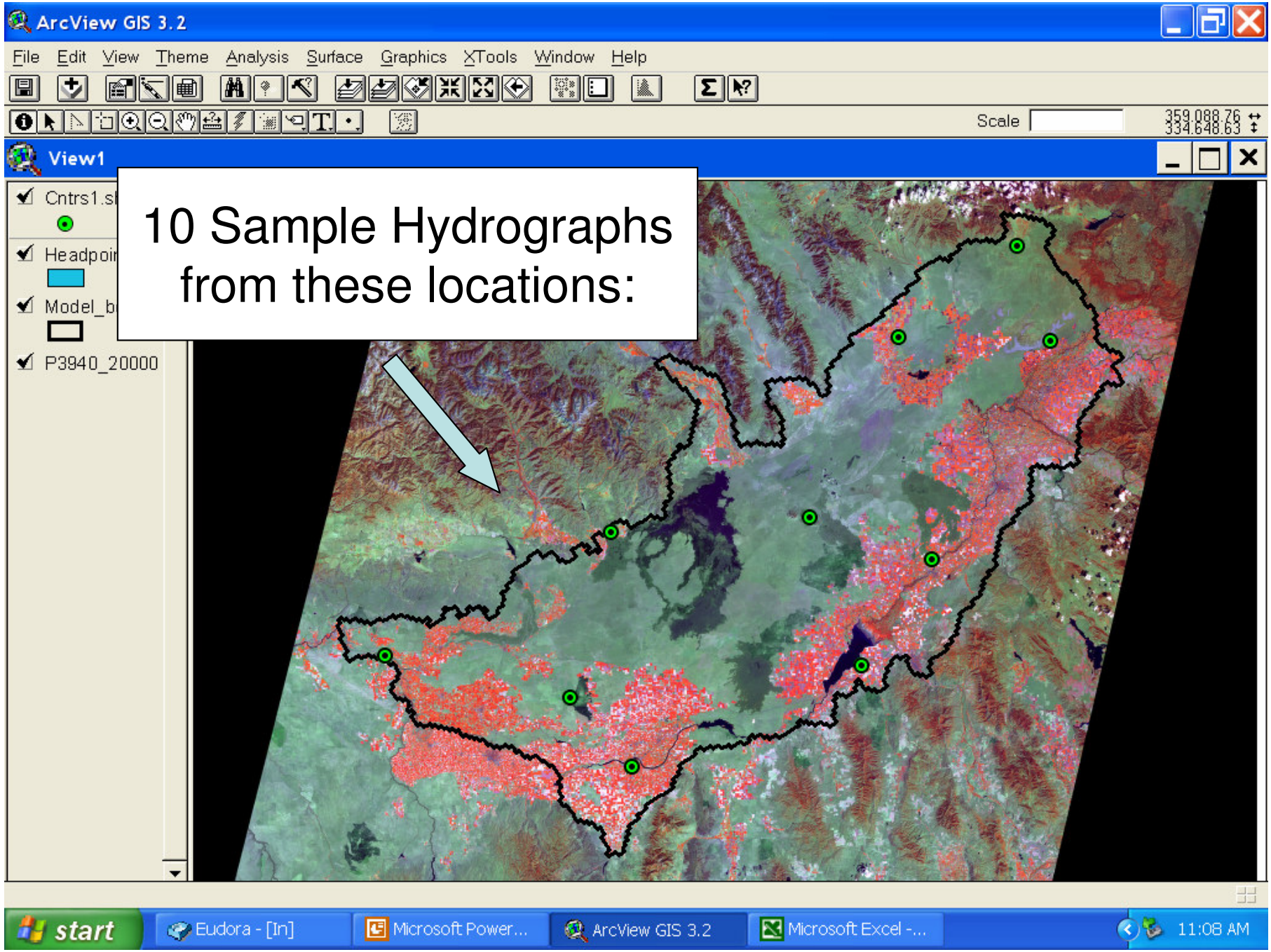

ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics XTools Window Help
Scale
339,975.04
124,635.78
View1
C305_startendhds.s
-150 - -100
-100 - -50
-50 - -20
-20 - -10
-10 - -3
-3 - 3
3 - 10
10 - 20
20 - 50
50 - 100
300-year Head Change
Simulation D15
start
Eudora - [In]
Microsoft Power...
ArcView GIS 3.2
Microsoft Excel -...
11:02 AM

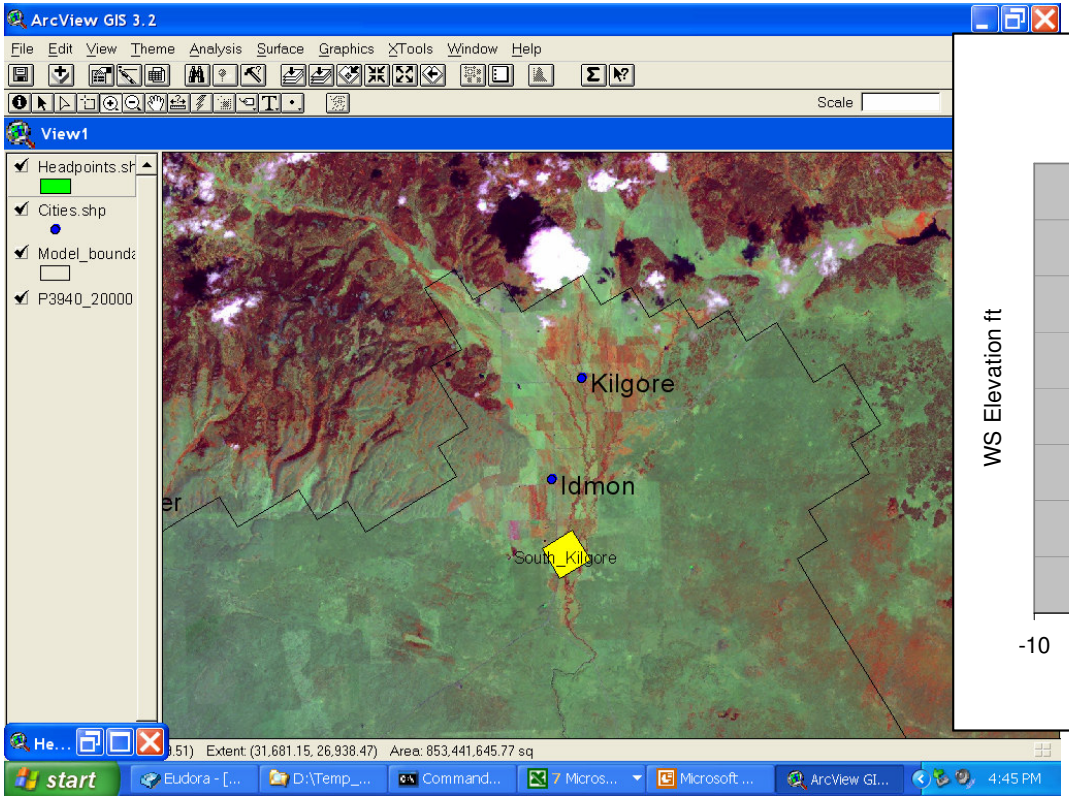

ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics XTools Window Help
Scale
507,877.91
202,956.32
View1
C305_startendhds.s
-150 - -100
-100 - -50
-50 - -20
-20 - -10
-10 - -3
-3 - 3
3 - 10
10 - 20
20 - 50
50 - 100
300-year Head Change
Simulation H10
start
Eudora - [In]
Microsoft Power...
ArcView GIS 3.2
Microsoft Excel -...
11:03 AM

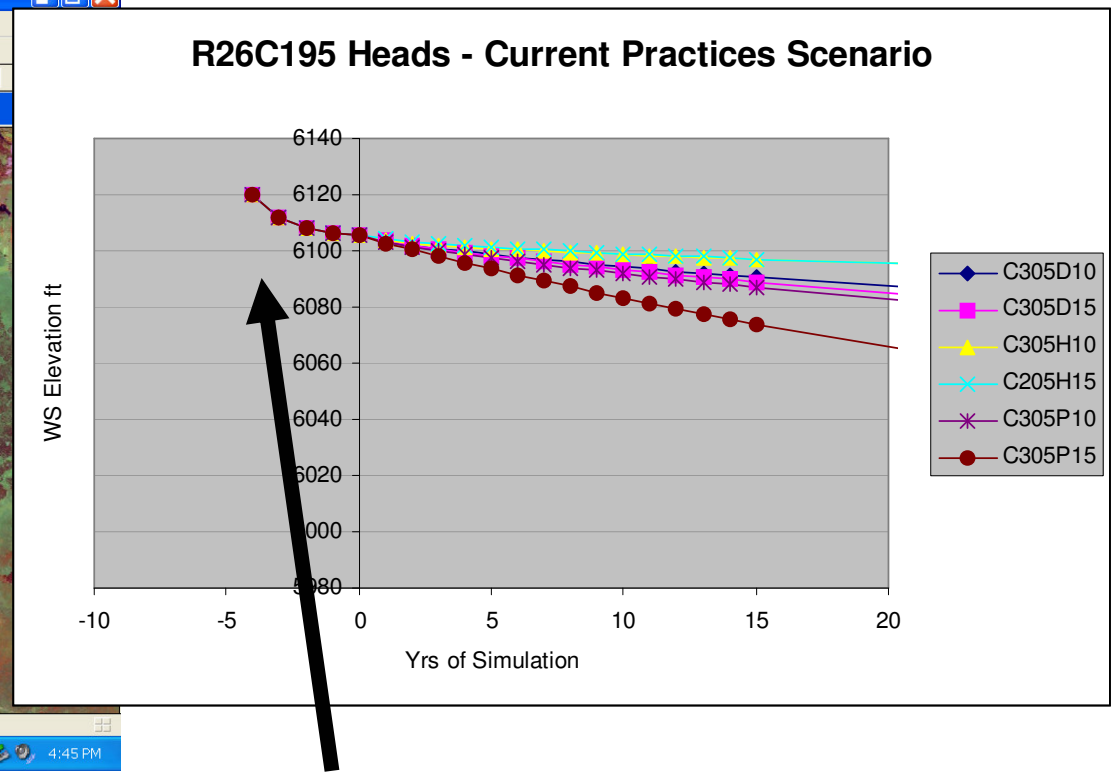

ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics XTools Window Help
Scale
461,295.10
388,775.65
View1
C305_startendhds.s
-150 - -100
-100 - -50
-50 - -20
-20 - -10
-10 - -3
-3 - 3
3 - 10
10 - 20
20 - 50
50 - 100
300-year Head Change
Simulation H15
start
Eudora - [In]
Microsoft Power...
ArcView GIS 3.2
Microsoft Excel -...
11:03 AM

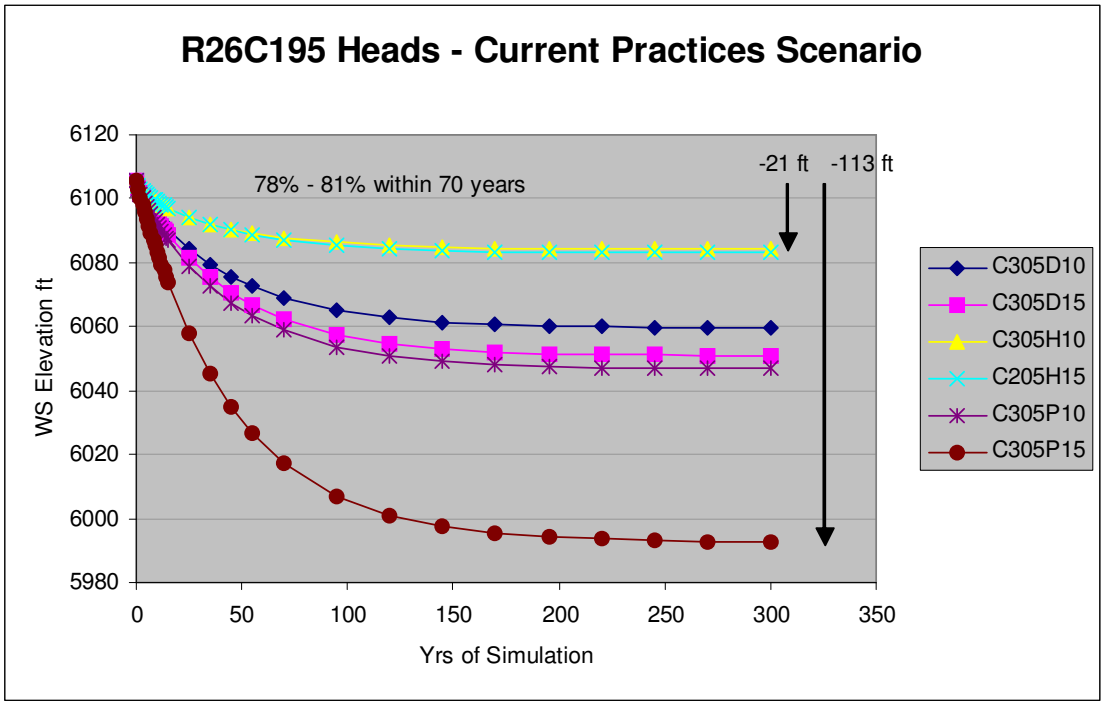

ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics XTools Window Help
Scale
391,164.94
238,277.35
View1
C305_startendhds.s
-150 - -100
-100 - -50
-50 - -20
-20 - -10
-10 - -3
-3 - 3
3 - 10
10 - 20
20 - 50
50 - 100
300-year Head Change
Simulation P10
start
Eudora - [In]
Microsoft Power...
ArcView GIS 3.2
Microsoft Excel -...
11:03 AM


ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics XTools Window Help
Scale
351,236.82
142,040.34
View1
C305_startendhds.s
-150 - -100
-100 - -50
-50 - -20
-20 - -10
-10 - -3
-3 - 3
3 - 10
10 - 20
20 - 50
50 - 100
300-year Head Change
Simulation P15
start
Eudora - [In]
Microsoft Power...
ArcView GIS 3.2
Microsoft Excel -...
11:04 AM


ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics XTools Window Help
Scale
View1
Cntrs1.sl
Headpoi
Model_b
P3940_20000
10 Sample Hydrographs from these locations:
start
Eudora - [In]
Microsoft Power...
ArcView GIS 3.2
Microsoft Excel -...
11:08 AM

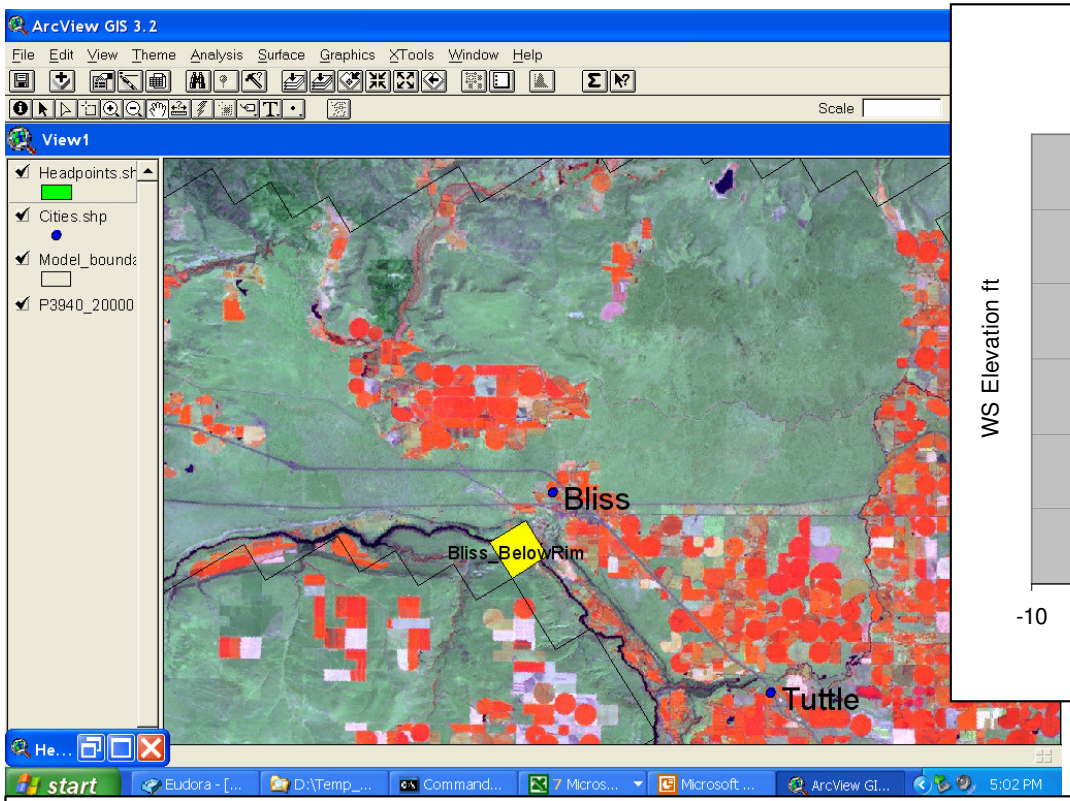


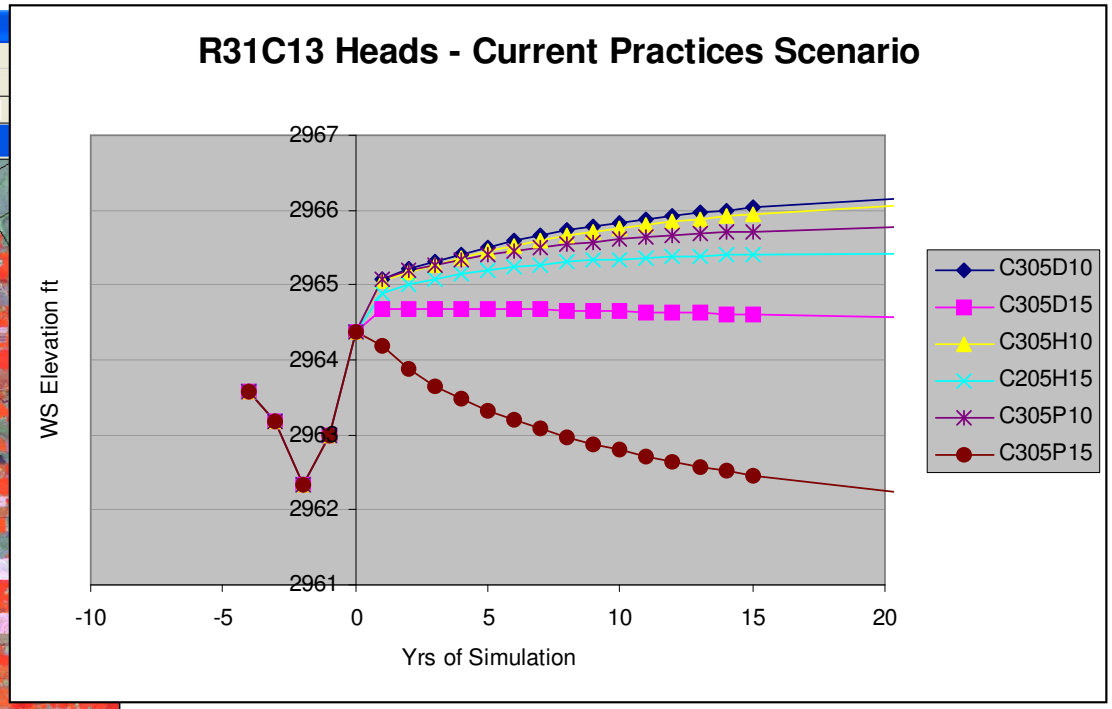


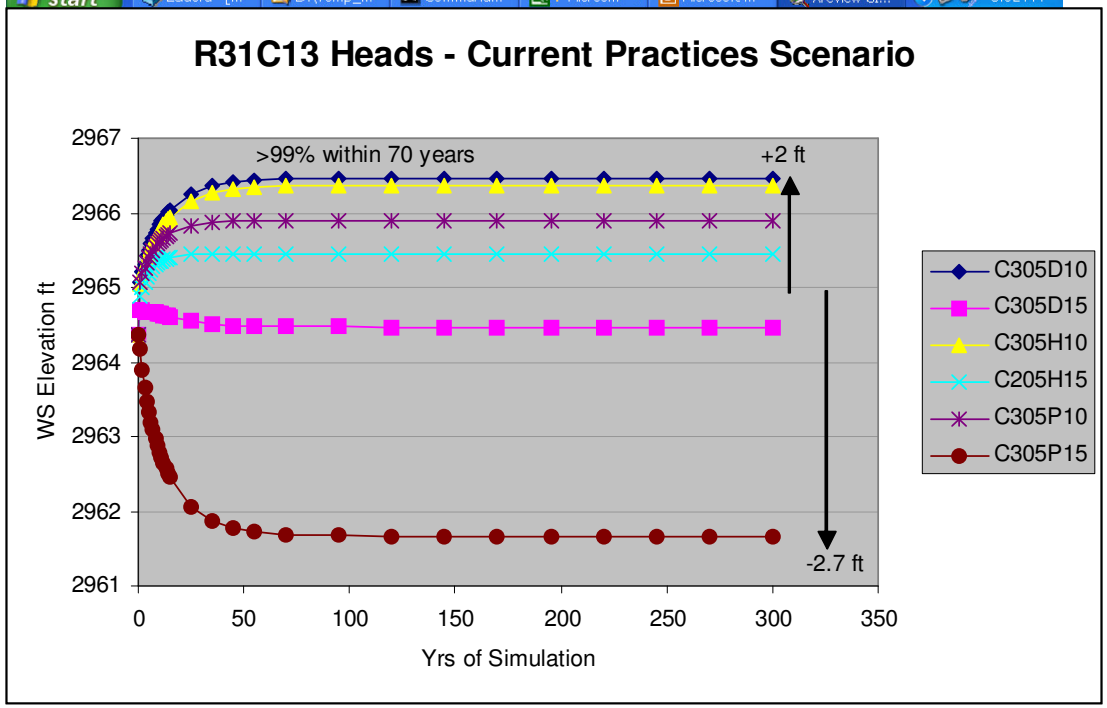


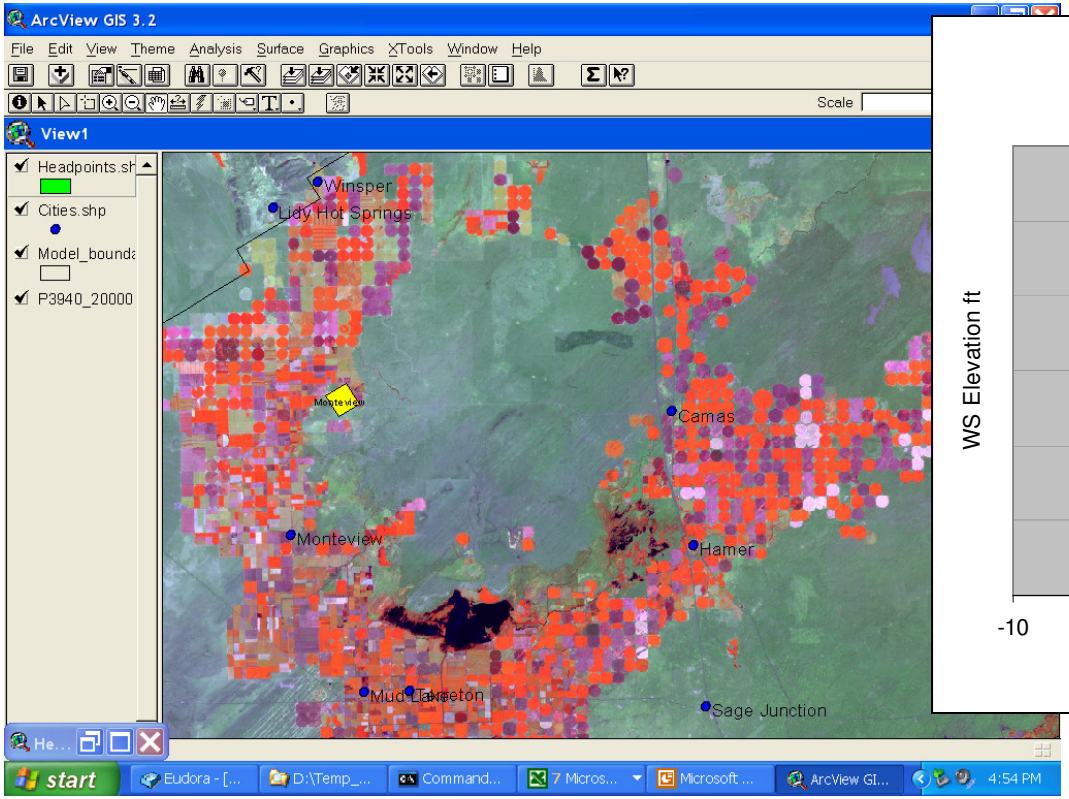
Note carefully the **five-year** pre-scenario period (extended data set w/ annual stress)

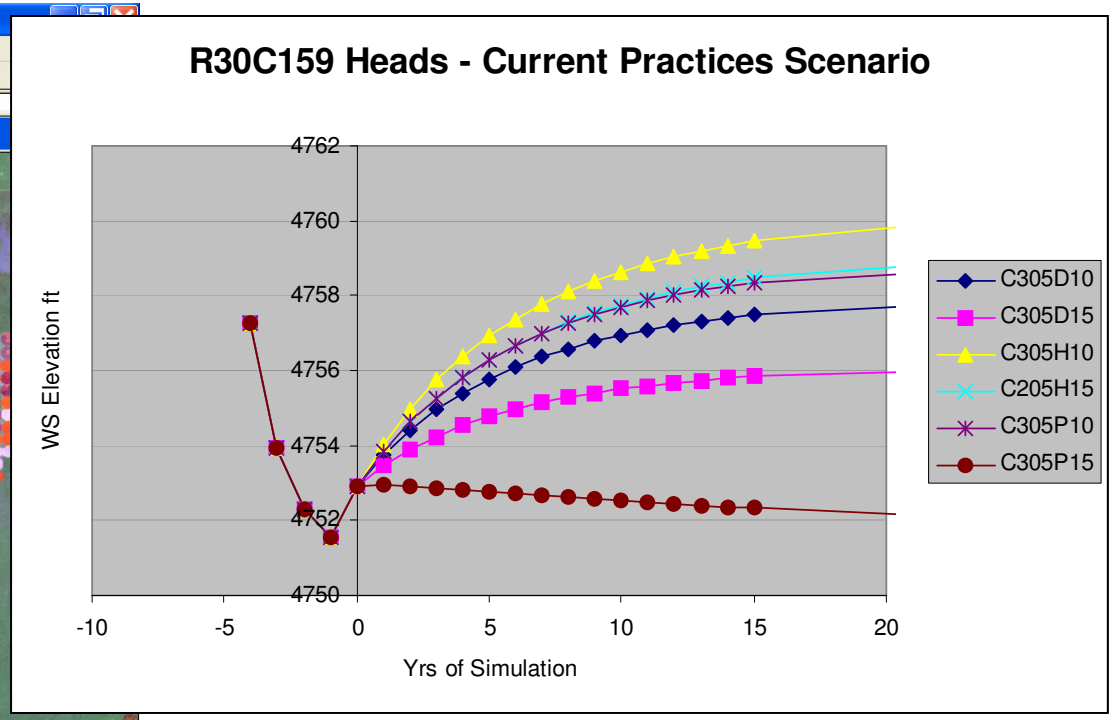
Is five years enough?

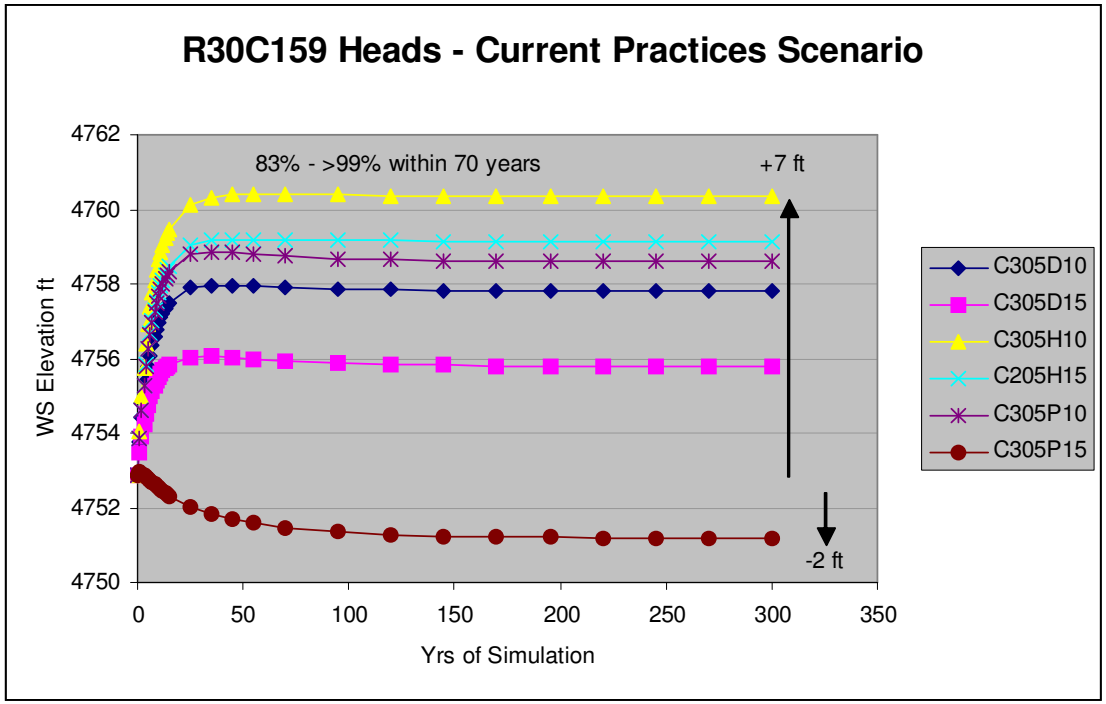

ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics XTools Window Help
Scale
View1
Headpoints.sh
Cities.shp
Model_bound
P3940_20000
Bliss
Bliss_BelowRim
Tuttle
start
Eudora - [...
D:\Temp_...
Command...
7 Micros...
Microsoft ...
ArcView GI...
5:02 PM

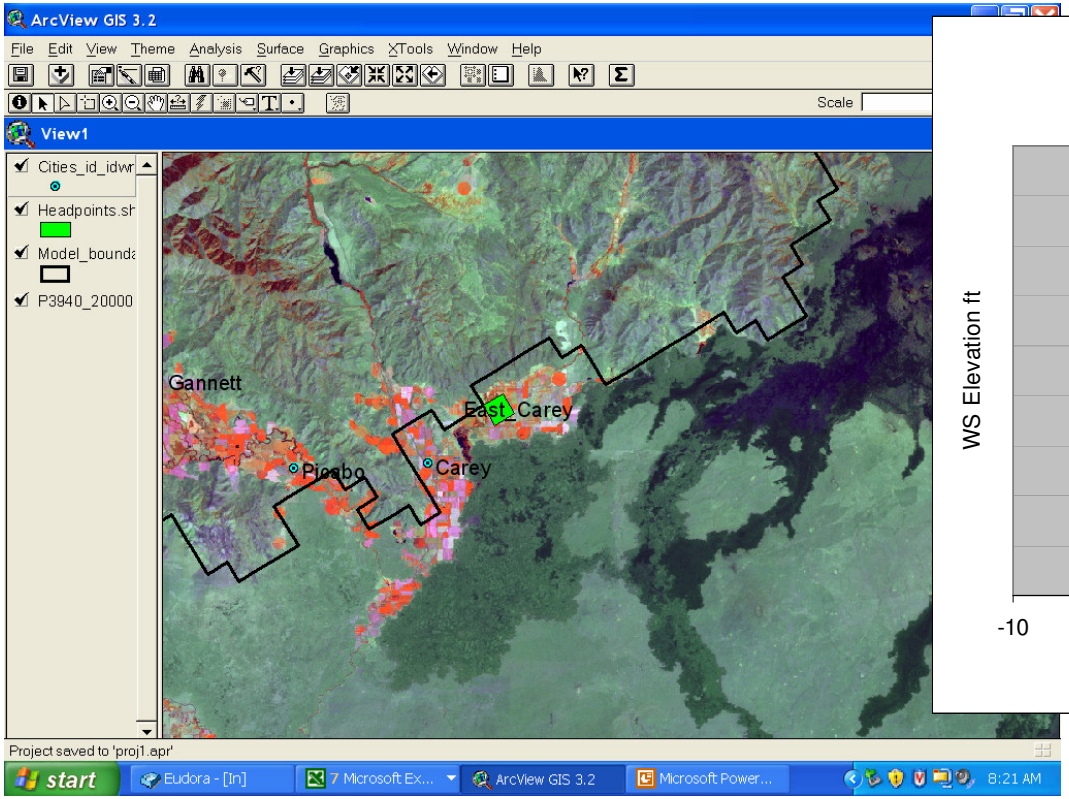

R31C13 Heads - Current Practices Scenario
WS Elevation ft
2967
2966
2965
2964
2963
2962
2961
-10
-5
0
5
10
15
20
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15

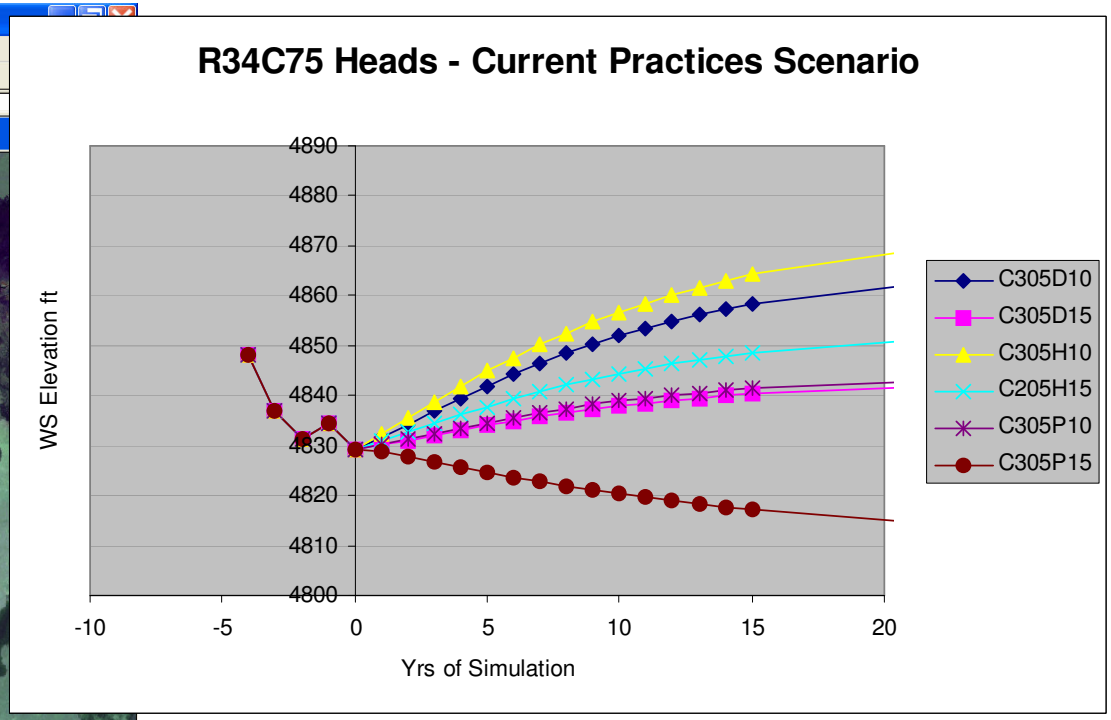

R31C13 Heads - Current Practices Scenario
>99% within 70 years
+2 ft
-2.7 ft
WS Elevation ft
2967
2966
2965
2964
2963
2962
2961
0
50
100
150
200
250
300
350
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15

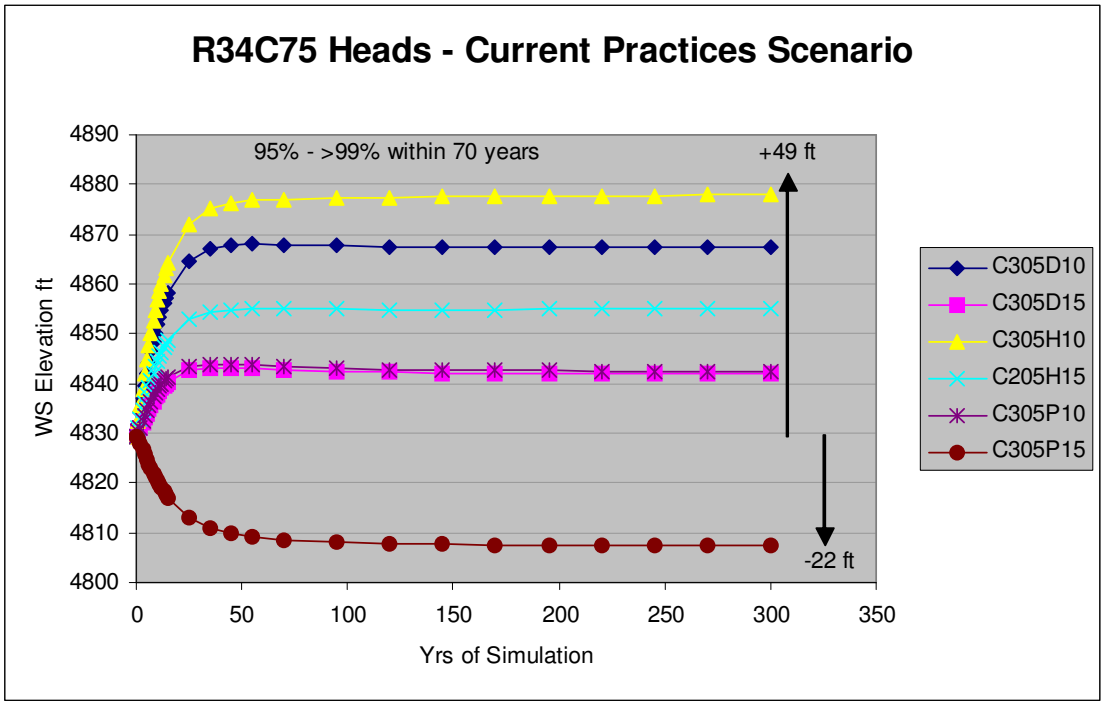

ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics XTools Window Help
View1
Headpoints.sh
Cities.shp
Model_bounda
P3940_20000
Winsper
Lidy Hot Springs
Monteview
Camas
Hamer
Mud Lake
Sage Junction
start
4:54 PM

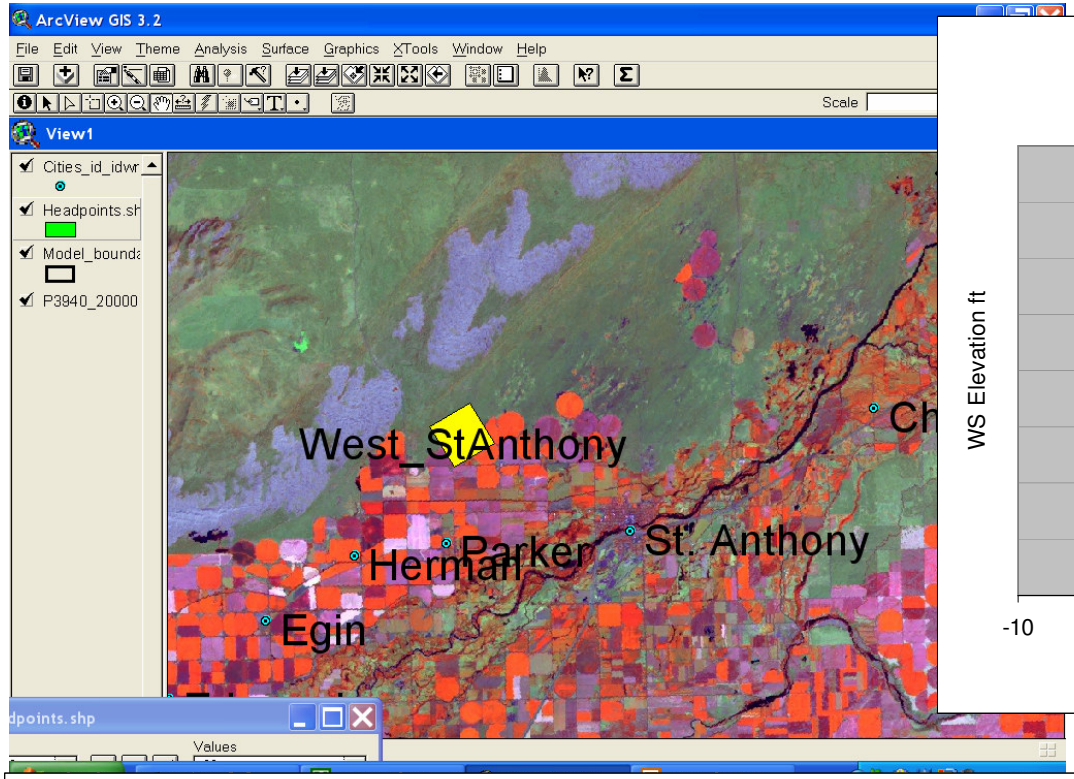

R30C159 Heads - Current Practices Scenario
WS Elevation ft
4762
4760
4758
4756
4754
4752
4750
-10
-5
0
5
10
15
20
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15

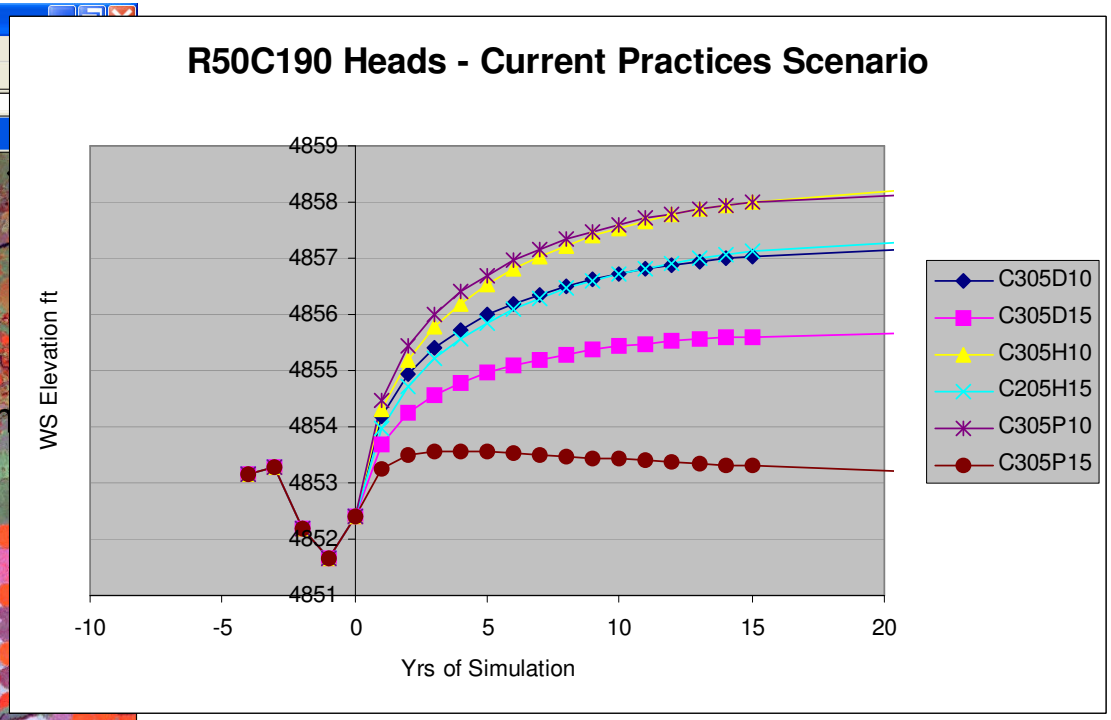

R30C159 Heads - Current Practices Scenario
83% - >99% within 70 years
+7 ft
-2 ft
WS Elevation ft
4762
4760
4758
4756
4754
4752
4750
0
50
100
150
200
250
300
350
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15

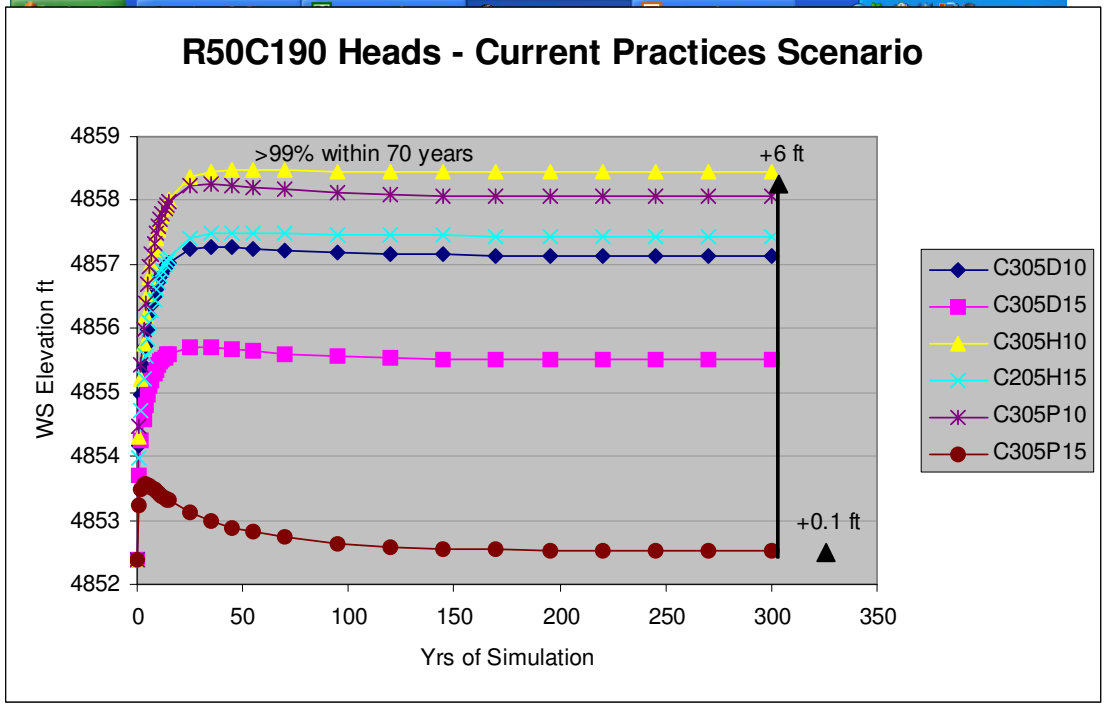

ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics XTools Window Help
View1
Cities_id_idwr
Headpoints.sh
Model_bounda
P3940_20000
Gannett
East Carey
Picabo
Carey
Project saved to 'proj1.apr'
start
Eudora - [In]
7 Microsoft Ex...
ArcView GIS 3.2
Microsoft Power...
8:21 AM

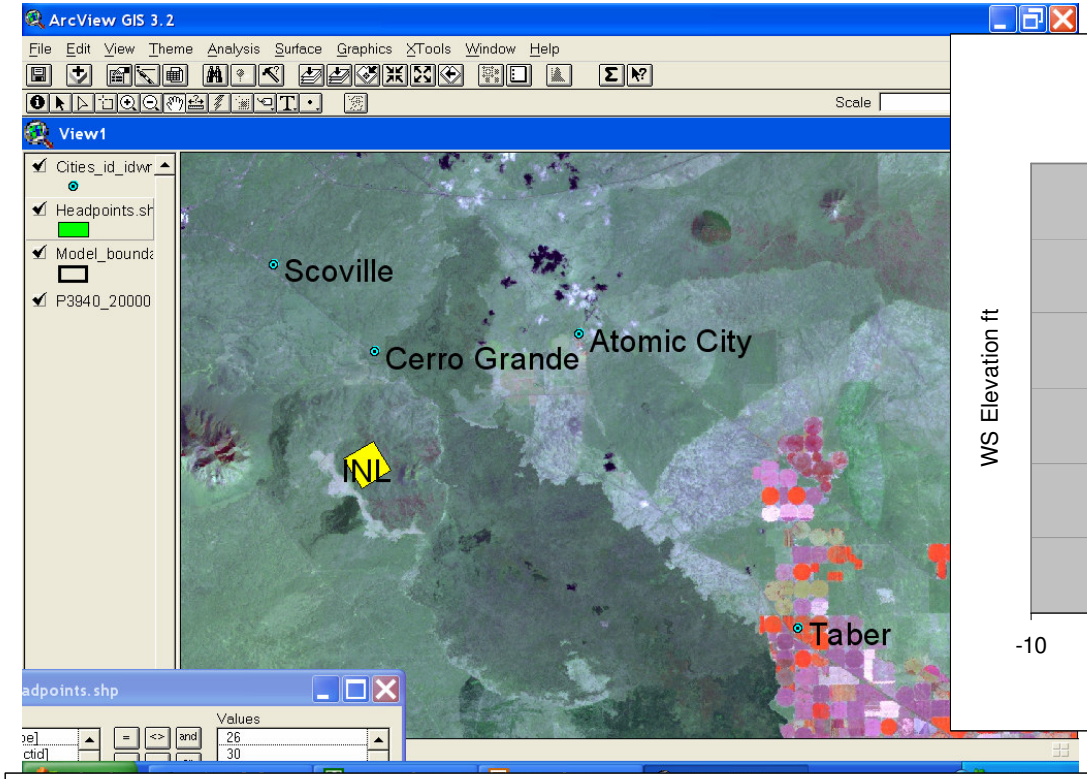

R34C75 Heads - Current Practices Scenario
WS Elevation ft
4890
4880
4870
4860
4850
4840
4830
4820
4810
4800
-10
-5
0
5
10
15
20
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15

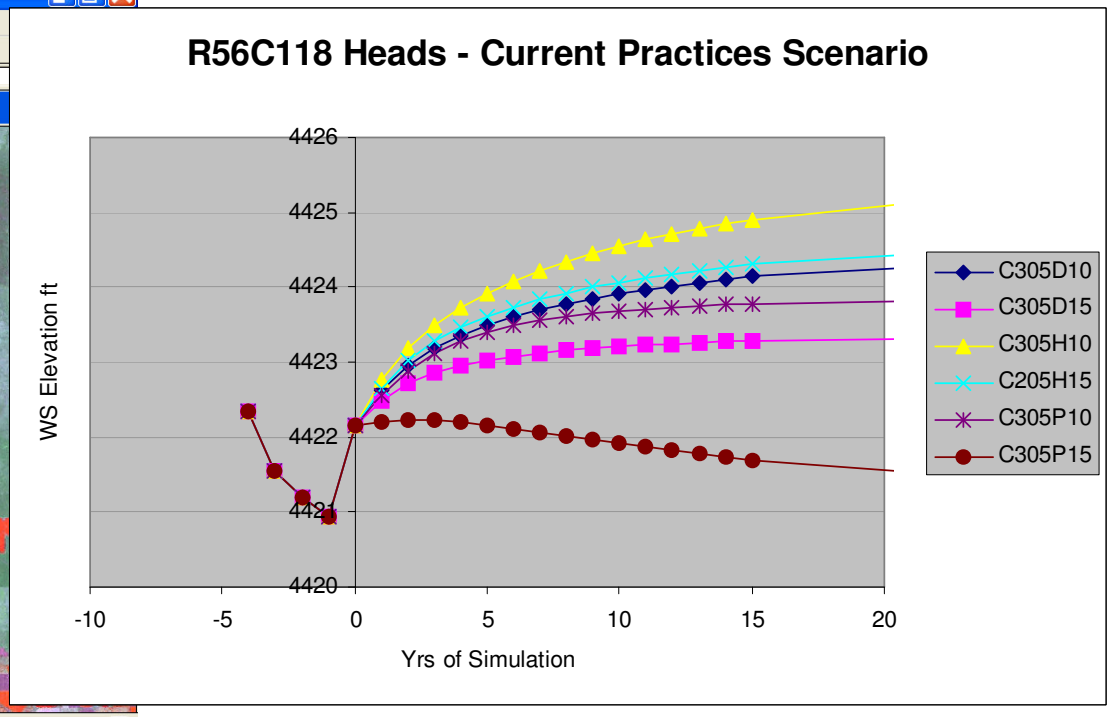

R34C75 Heads - Current Practices Scenario
95% - >99% within 70 years
+49 ft
-22 ft
WS Elevation ft
4890
4880
4870
4860
4850
4840
4830
4820
4810
4800
0
50
100
150
200
250
300
350
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15

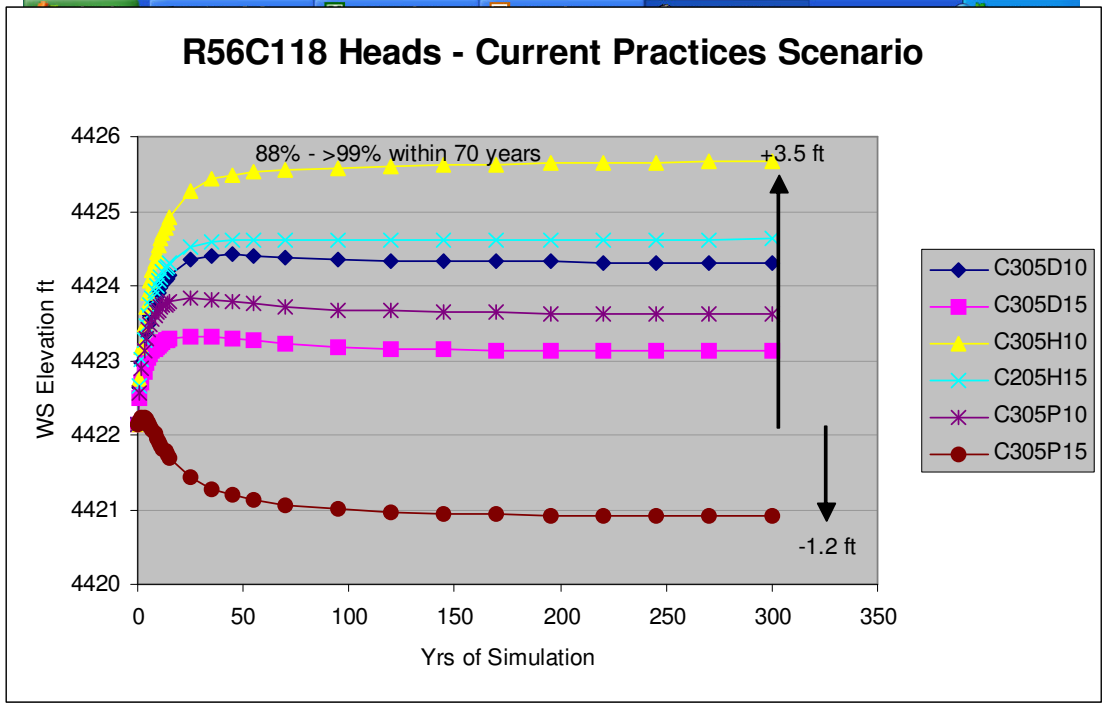

ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics XTools Window Help
Scale
View1
Cities_id_idwr
Headpoints.sh
Model_bounda
P3940_20000
West_StAnthony
Parker
Herman
St. Anthony
Egin
Ch
dpoints.shp
Values

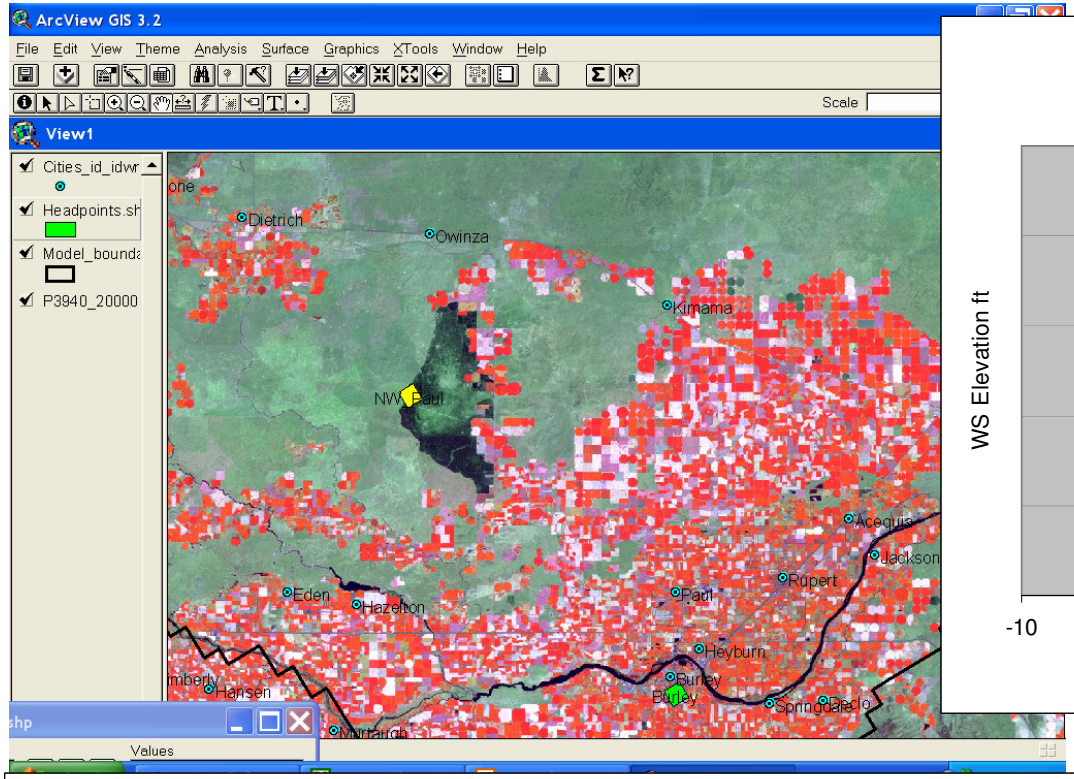

R50C190 Heads - Current Practices Scenario
WS Elevation ft
4859
4858
4857
4856
4855
4854
4853
4852
4851
-10
-5
0
5
10
15
20
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15

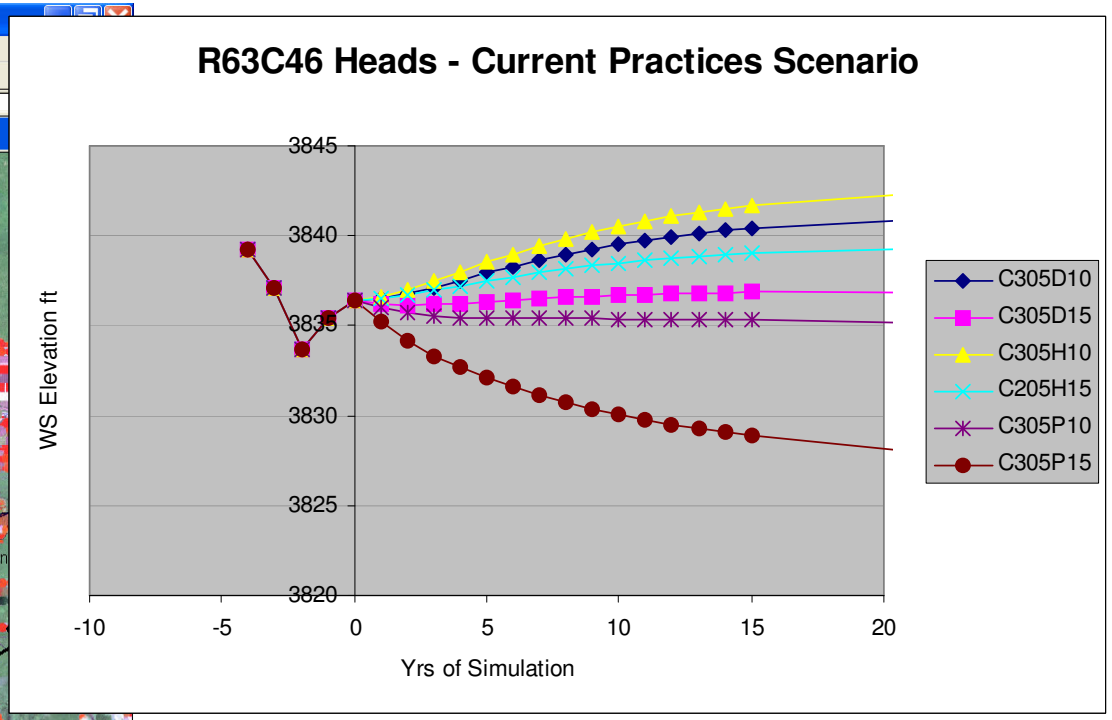

R50C190 Heads - Current Practices Scenario
>99% within 70 years
+6 ft
+0.1 ft
WS Elevation ft
4859
4858
4857
4856
4855
4854
4853
4852
0
50
100
150
200
250
300
350
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15

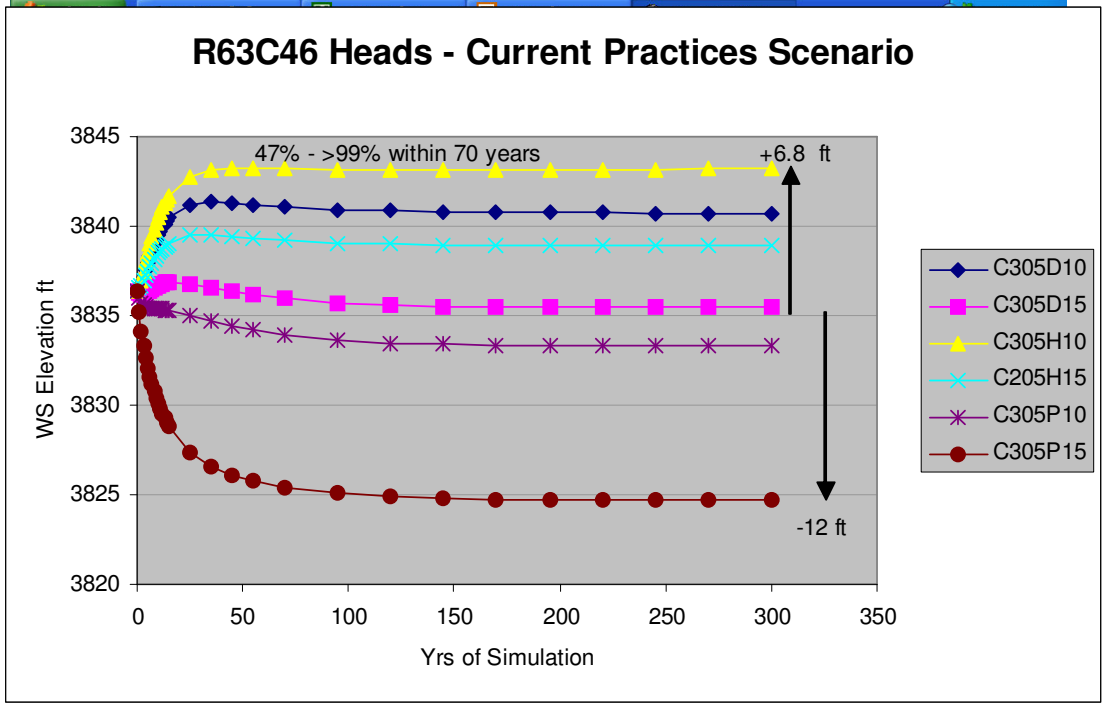

ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics XTools Window Help
View1
Cities_id_idwr
Headpoints.sh
Model_bound
P3940_20000
Scoville
Cerro Grande
Atomic City
INL
Taber
Values
26
30

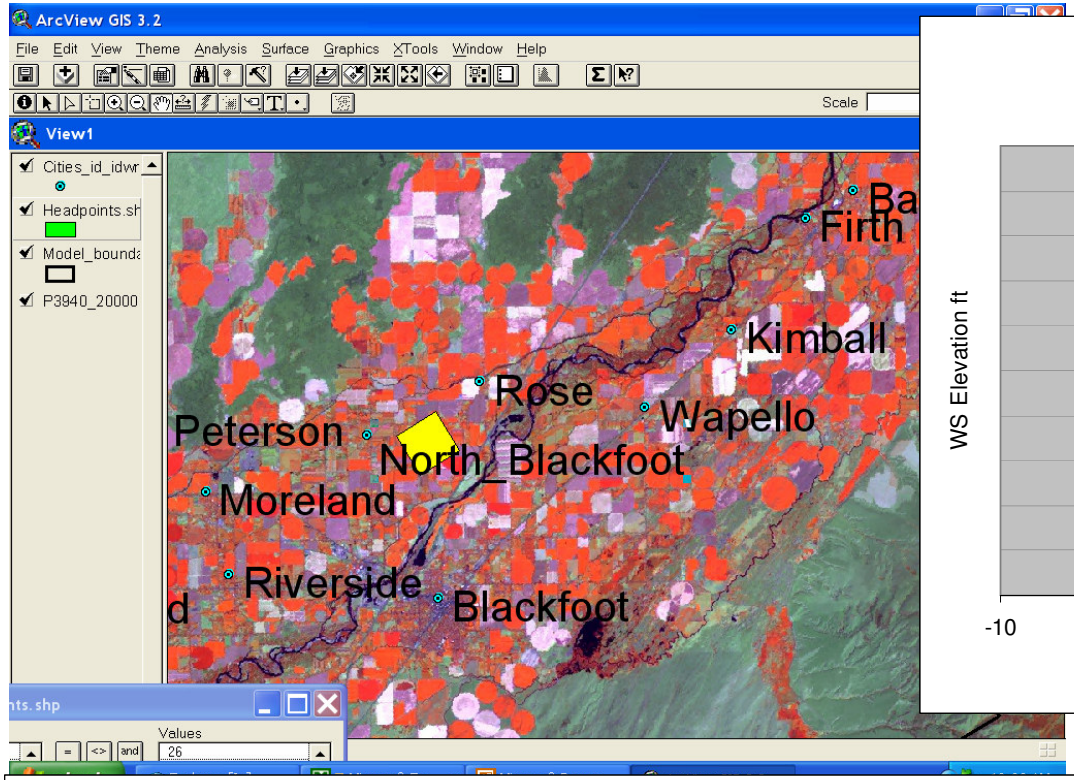

R56C118 Heads - Current Practices Scenario
WS Elevation ft
4426
4425
4424
4423
4422
4421
4420
-10
-5
0
5
10
15
20
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15

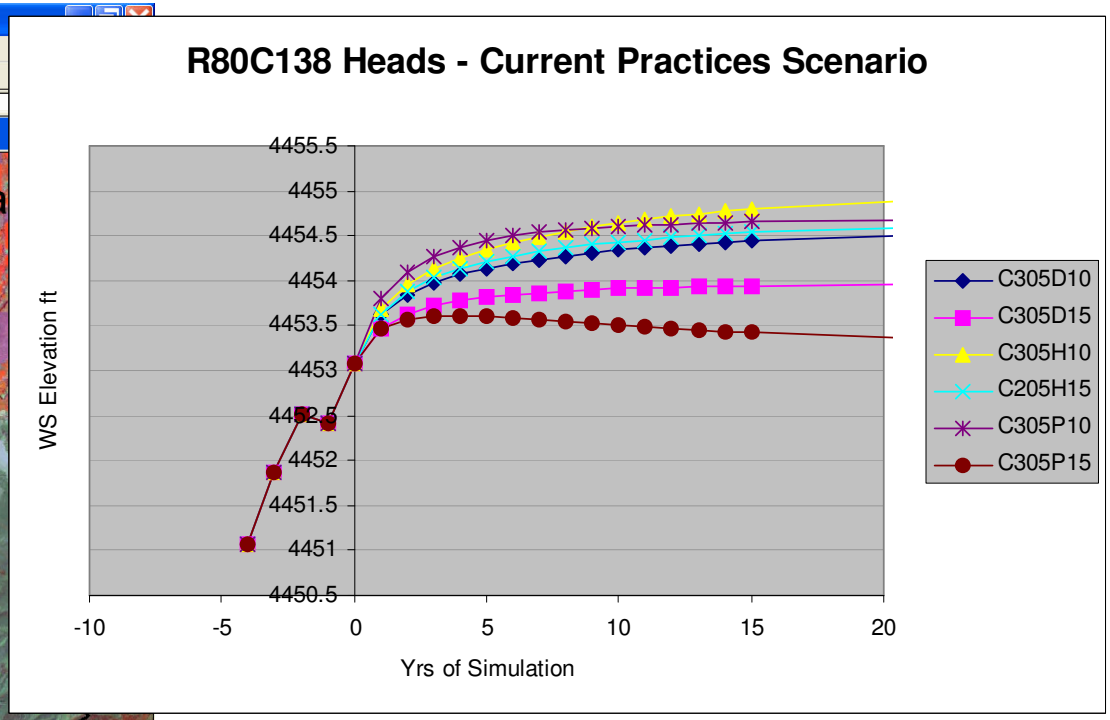

R56C118 Heads - Current Practices Scenario
88% - >99% within 70 years
+3.5 ft
-1.2 ft
WS Elevation ft
4426
4425
4424
4423
4422
4421
4420
0
50
100
150
200
250
300
350
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15

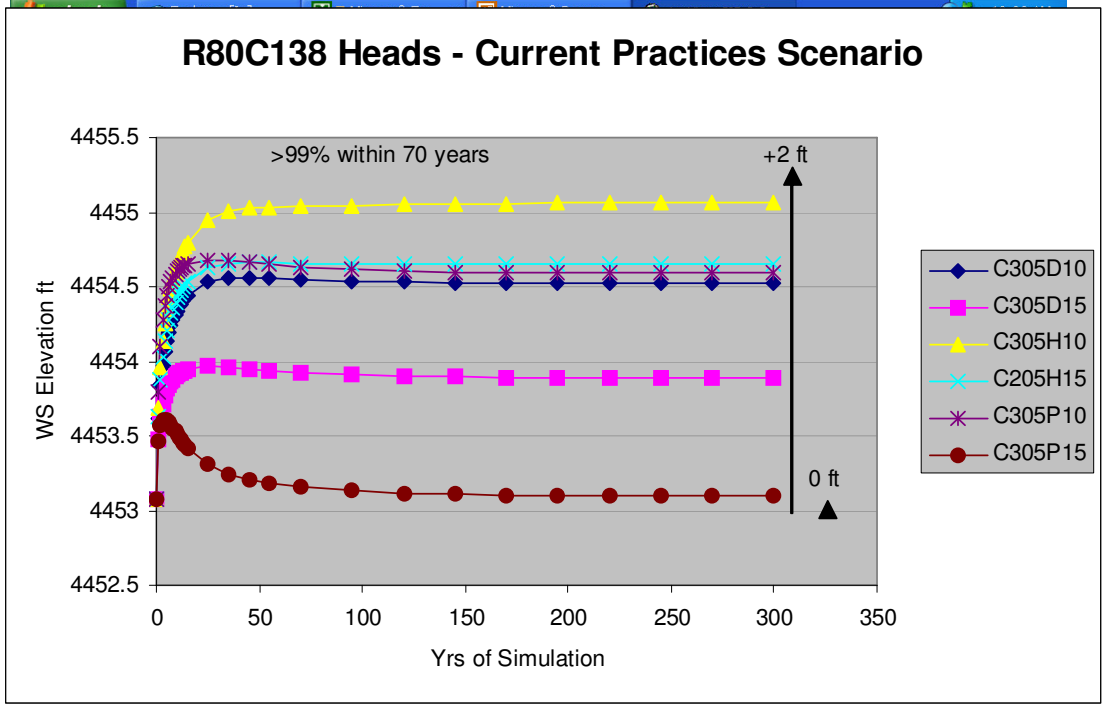

ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics XTools Window Help
Scale
View1
Cities_id_idwr
Headpoints.sh
Model_bounda
P3940_20000
Dietrich
Owinza
Kimama
NW Paul
Acequia
Jackson
Rupert
Paul
Eden
Hazelton
Heyburn
Burley
Hansen
Springdale
Declo
Values

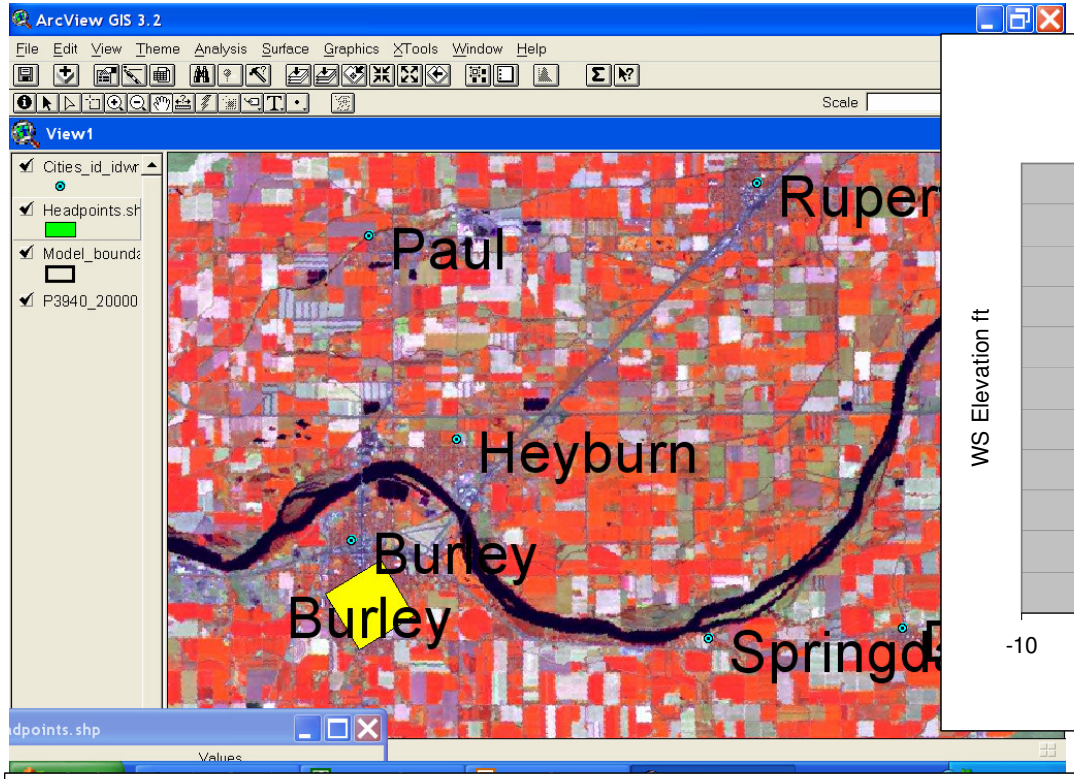

R63C46 Heads - Current Practices Scenario
WS Elevation ft
3845
3840
3835
3830
3825
3820
-10
-5
0
5
10
15
20
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15

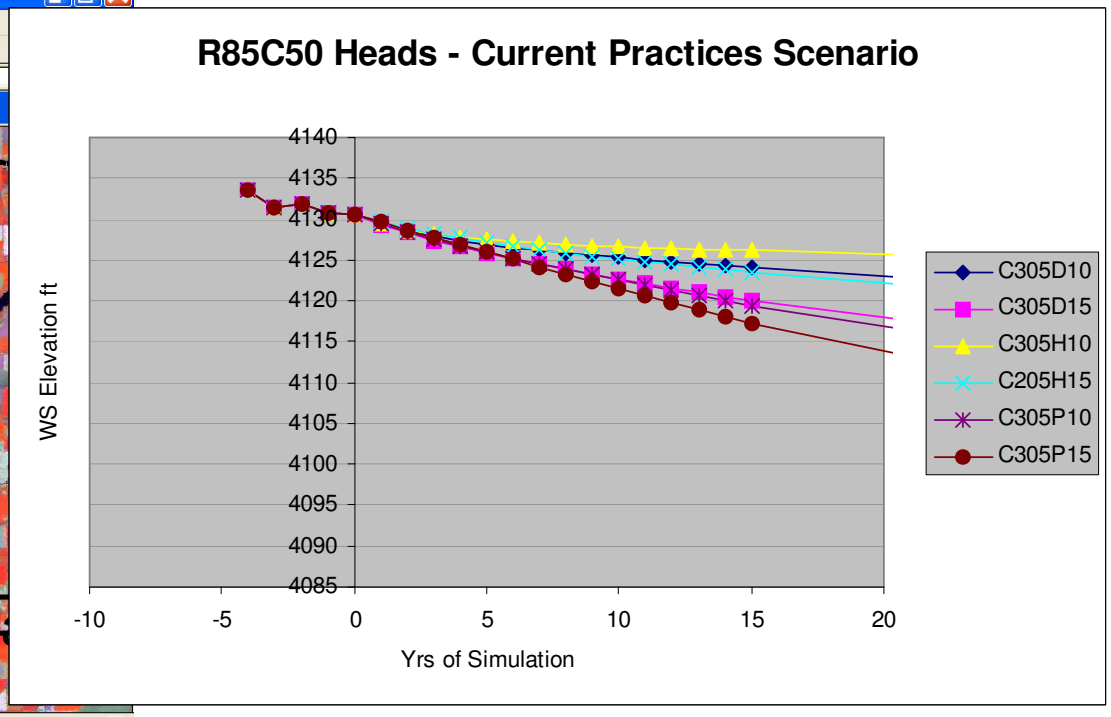

R63C46 Heads - Current Practices Scenario
47% - >99% within 70 years
+6.8 ft
-12 ft
WS Elevation ft
3845
3840
3835
3830
3825
3820
0
50
100
150
200
250
300
350
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15

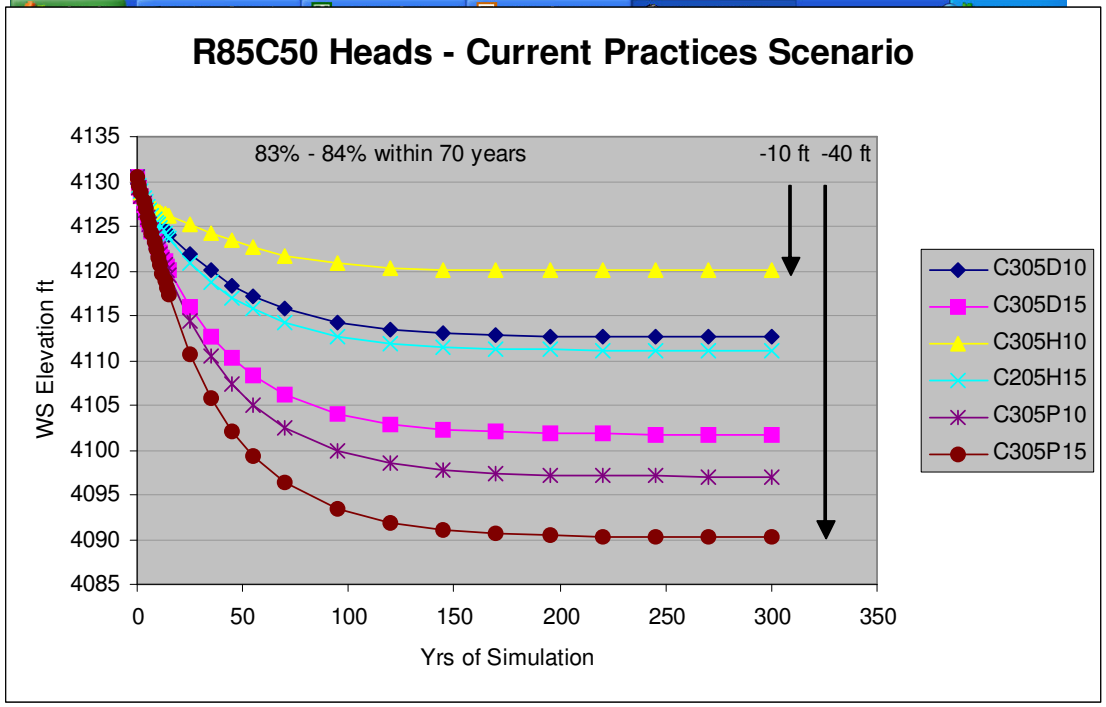

ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics XTools Window Help
Scale
View1
Cities_id_idwr
Headpoints.sh
Model_bounda
P3940_20000
Ba
Firth
Kimball
Rose
Wapello
Peterson
North_Blackfoot
Moreland
Riverside
Blackfoot
d
nts.shp
Values
26

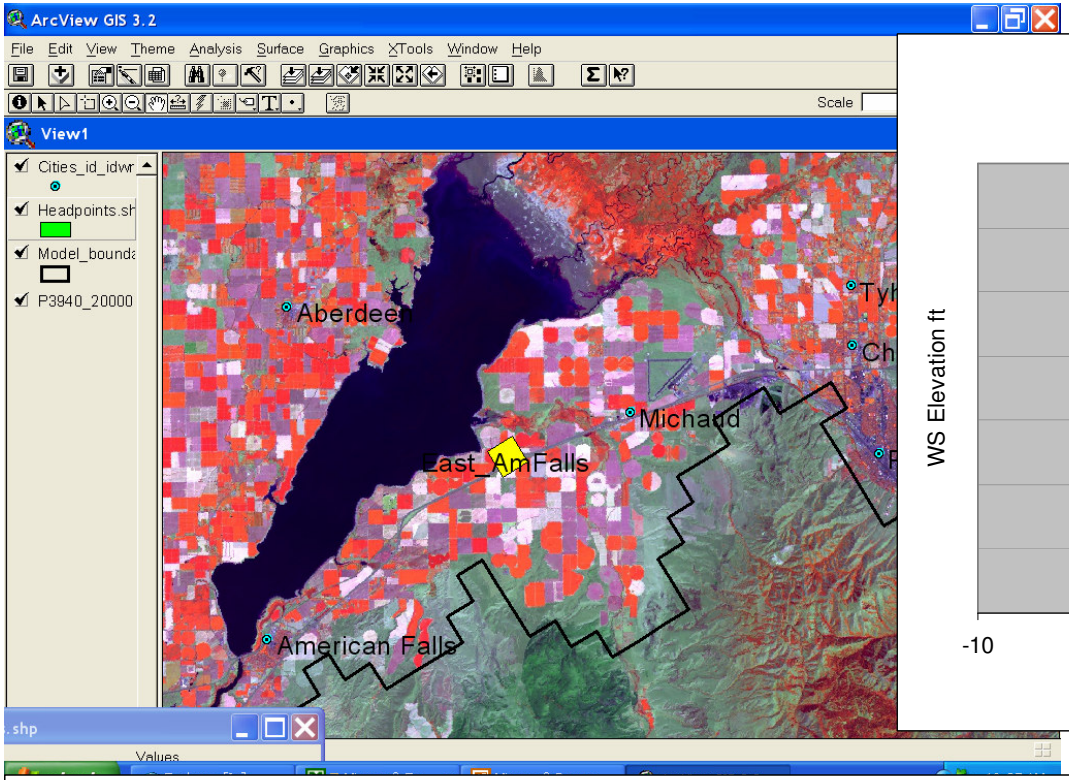

R80C138 Heads - Current Practices Scenario
WS Elevation ft
4455.5
4455
4454.5
4454
4453.5
4453
4452.5
4452
4451.5
4451
4450.5
-10
-5
0
5
10
15
20
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15

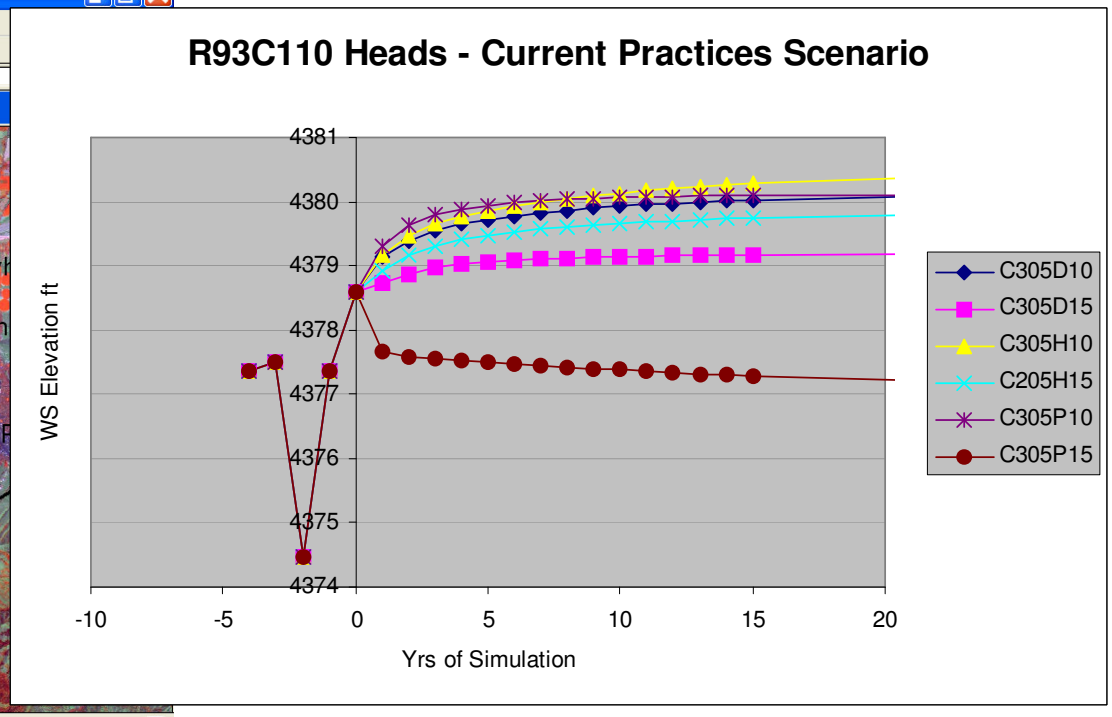

R80C138 Heads - Current Practices Scenario
>99% within 70 years
+2 ft
0 ft
WS Elevation ft
4455.5
4455
4454.5
4454
4453.5
4453
4452.5
0
50
100
150
200
250
300
350
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15

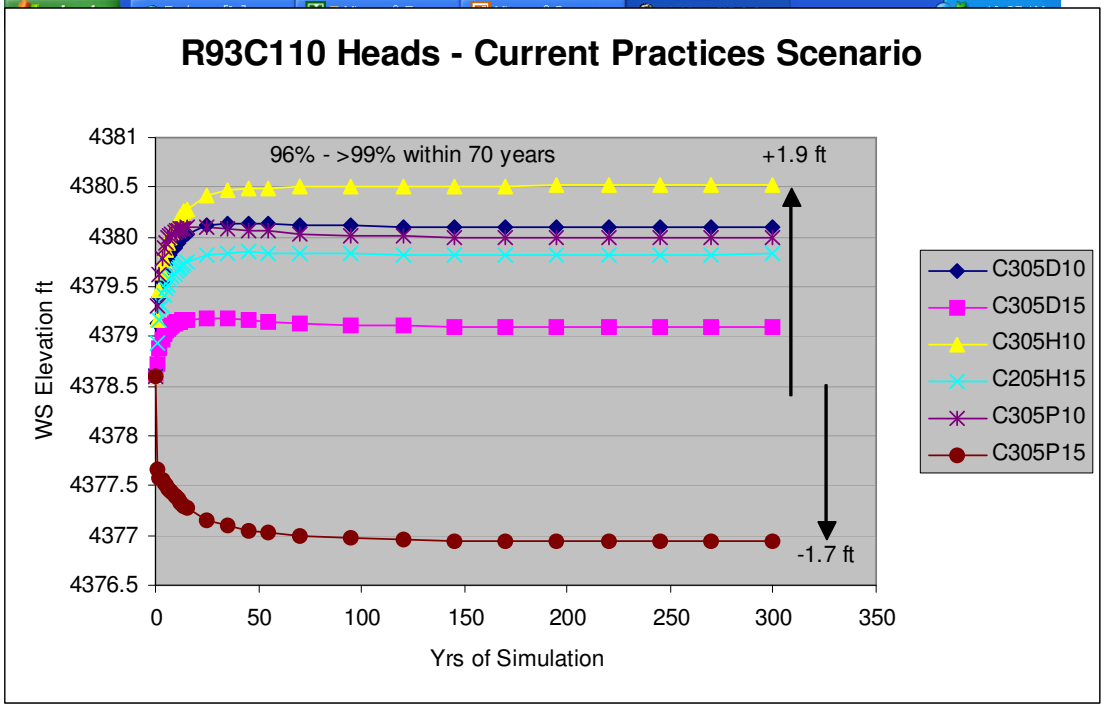

ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics XTools Window Help
Scale
View1
Cities_id_idwr
Headpoints.sh
Model_bounda
P3940_20000
Paul
Heyburn
Burley
Burley
Springd
Values


R85C50 Heads - Current Practices Scenario
WS Elevation ft
4140
4135
4130
4125
4120
4115
4110
4105
4100
4095
4090
4085
-10
-5
0
5
10
15
20
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15


R85C50 Heads - Current Practices Scenario
83% - 84% within 70 years
-10 ft
-40 ft
WS Elevation ft
4135
4130
4125
4120
4115
4110
4105
4100
4095
4090
4085
0
50
100
150
200
250
300
350
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15


ArcView GIS 3.2
File Edit View Theme Analysis Surface Graphics XTools Window Help
View1
Cities_id_idwr
Headpoints.sh
Model_bounda
P3940_20000
Aberdeen
Michaud
East_AmFalls
American Falls


R93C110 Heads - Current Practices Scenario
WS Elevation ft
4381
4380
4379
4378
4377
4376
4375
4374
-10
-5
0
5
10
15
20
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15


R93C110 Heads - Current Practices Scenario
96% - >99% within 70 years
+1.9 ft
-1.7 ft
WS Elevation ft
4381
4380.5
4380
4379.5
4379
4378.5
4378
4377.5
4377
4376.5
0
50
100
150
200
250
300
350
Yrs of Simulation
C305D10
C305D15
C305H10
C205H15
C305P10
C305P15

2. Change in Gains/Losses/Discharge

Range of changes in gains predicted by six input data sets

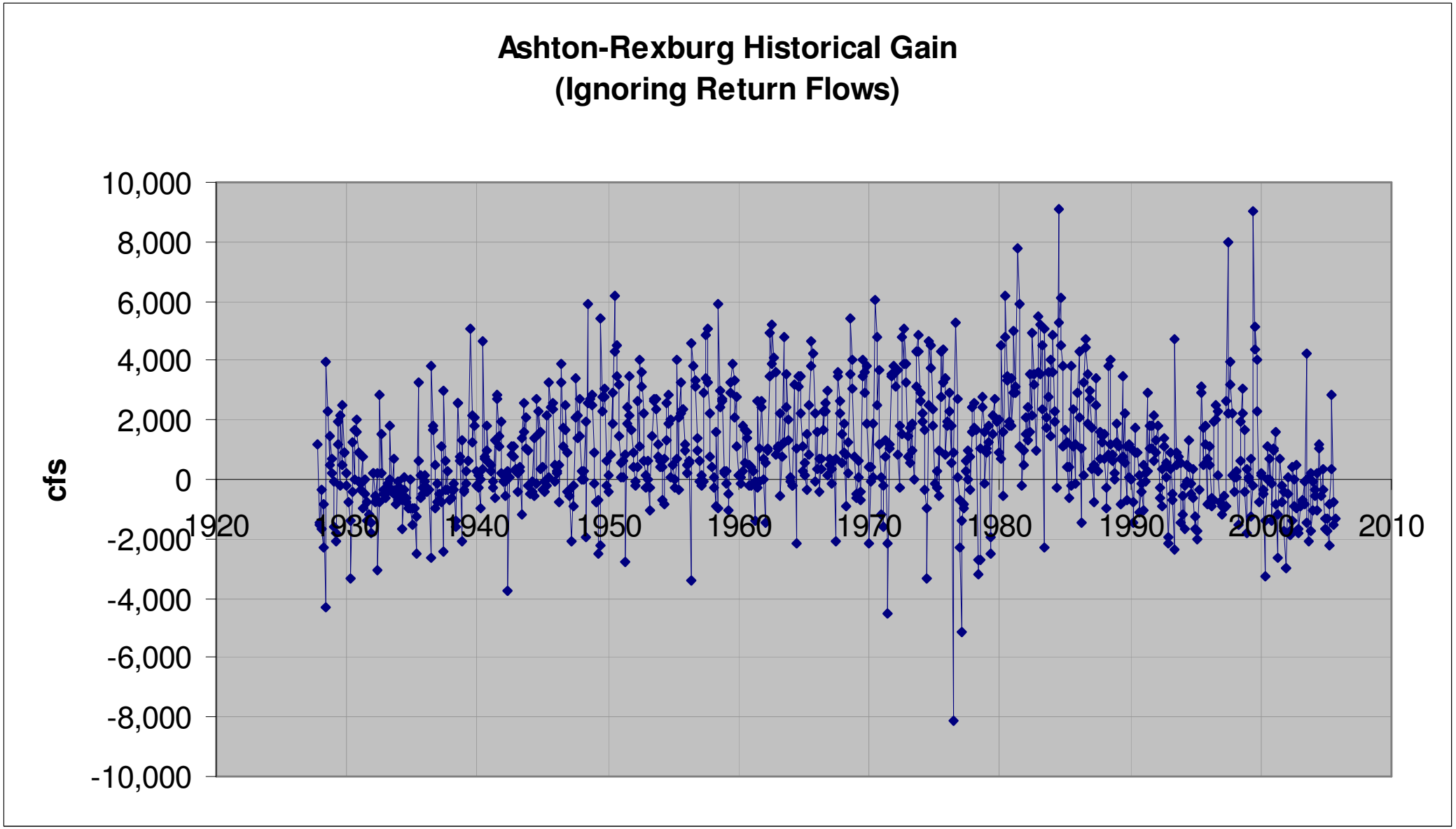
Reach	Median	Max	Min
Ash-Rex	206	273	34
Hei-She	1	23	-52
She-NB	51	60	0
NB-Nee	129	190	-53
Nee-Min	0	16	-25
DWB-Bul	-4	23	-72
Bul-KSP	-8	4	-41
KSP	-9	-1	-37
KSP-Mld	-1	-1	-3
Mld	-12	-7	-32
Mld-Ban	-1	0.5	-6.5

Only one reach has all six data sets showing a positive change over time (from today's condition)

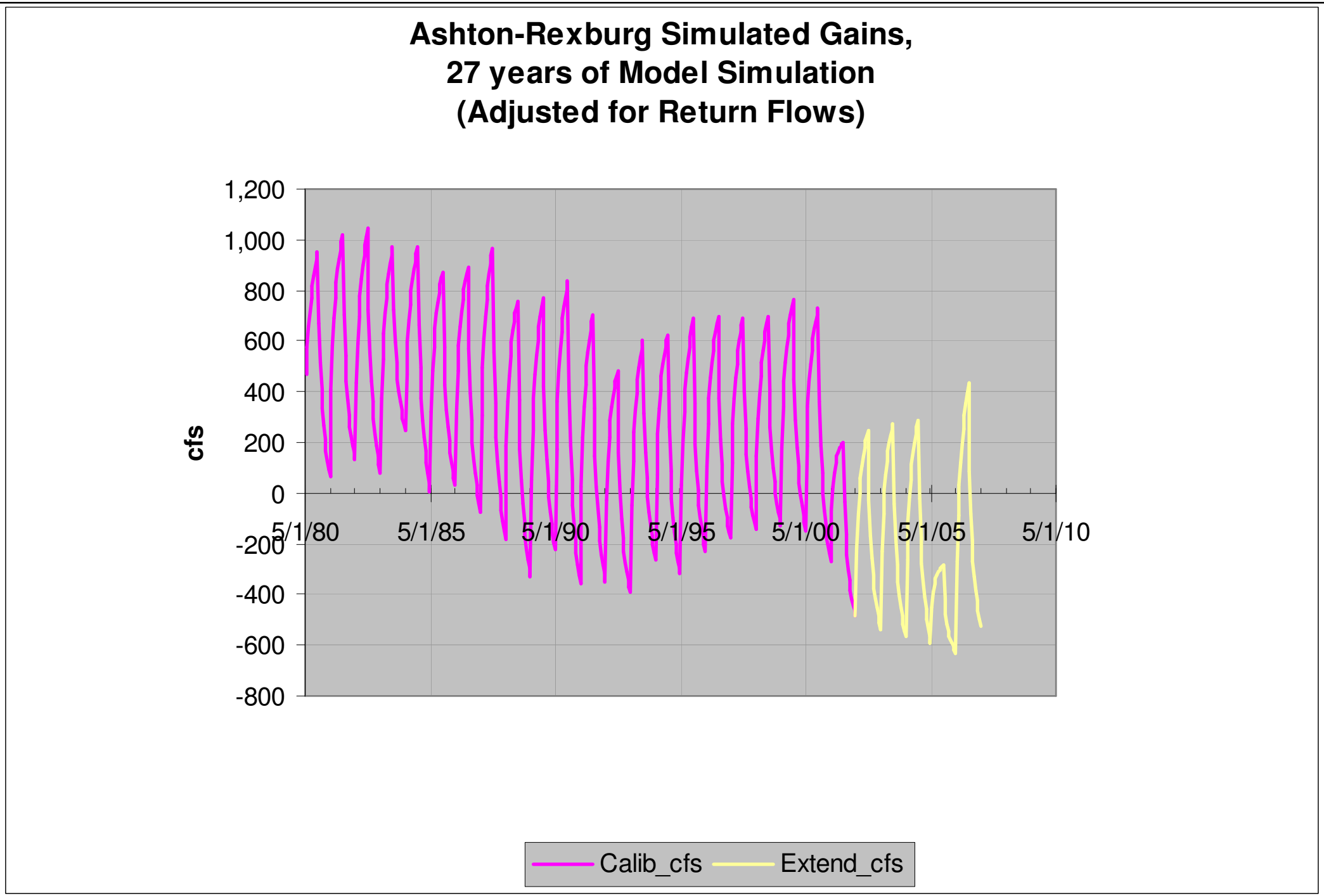
For three reaches, all six data sets show a negative (albeit small) change over time

For seven reaches, the results are mixed

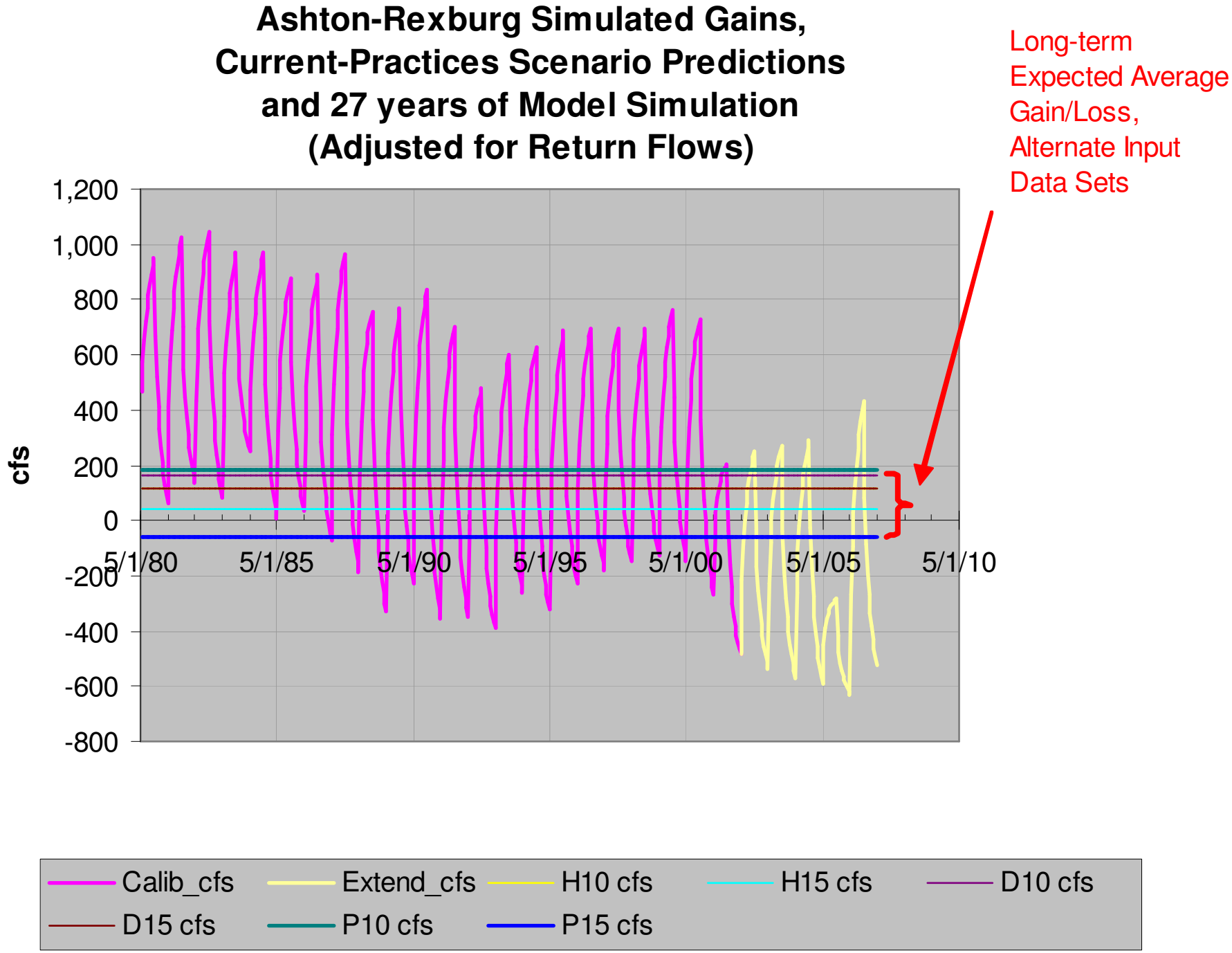
The next several slides illustrate possible ways to show results



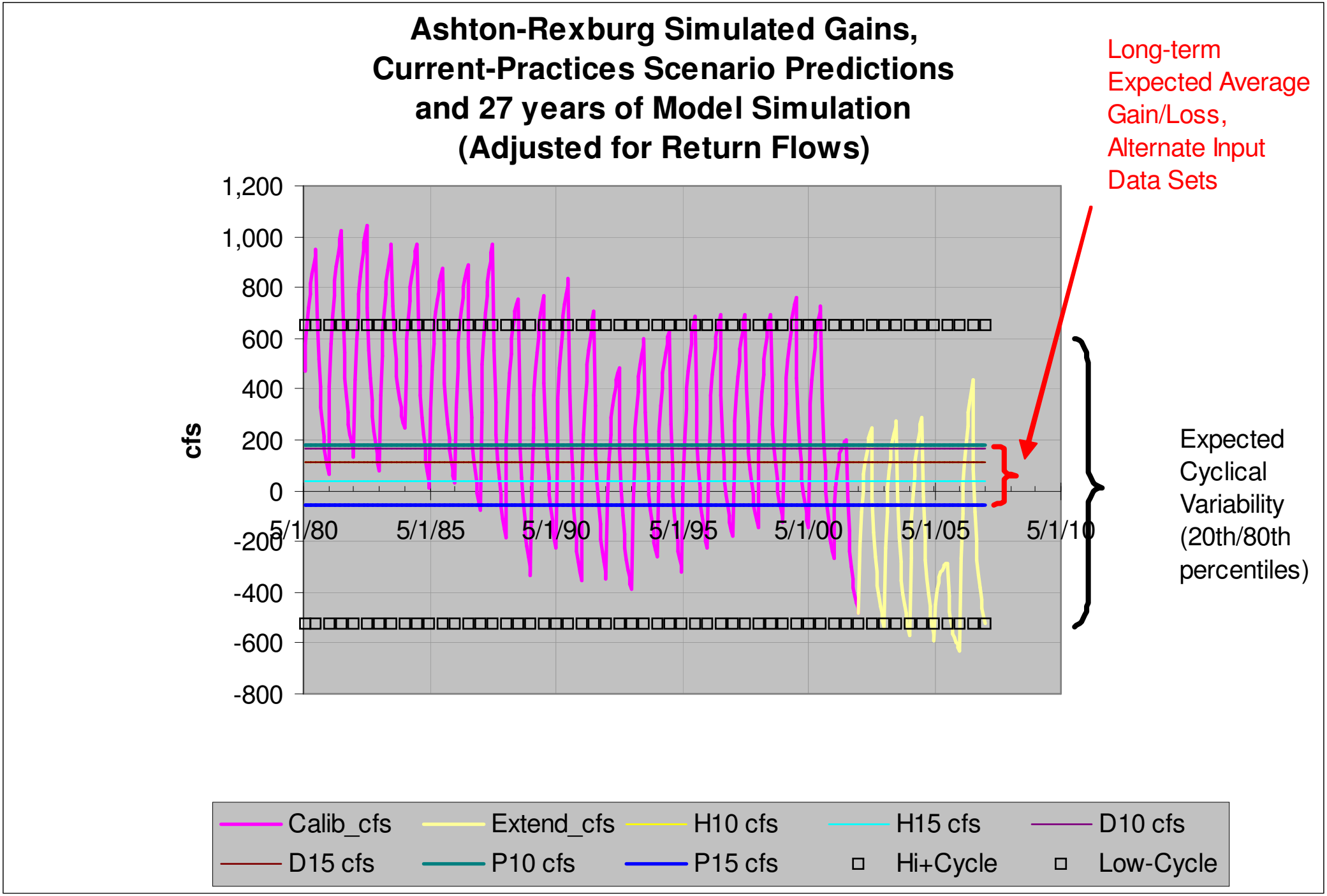
Step 1: Gains from historical observations. Note that these gains ***ignore returns.*** Any return flows that occur are included here as part of gains



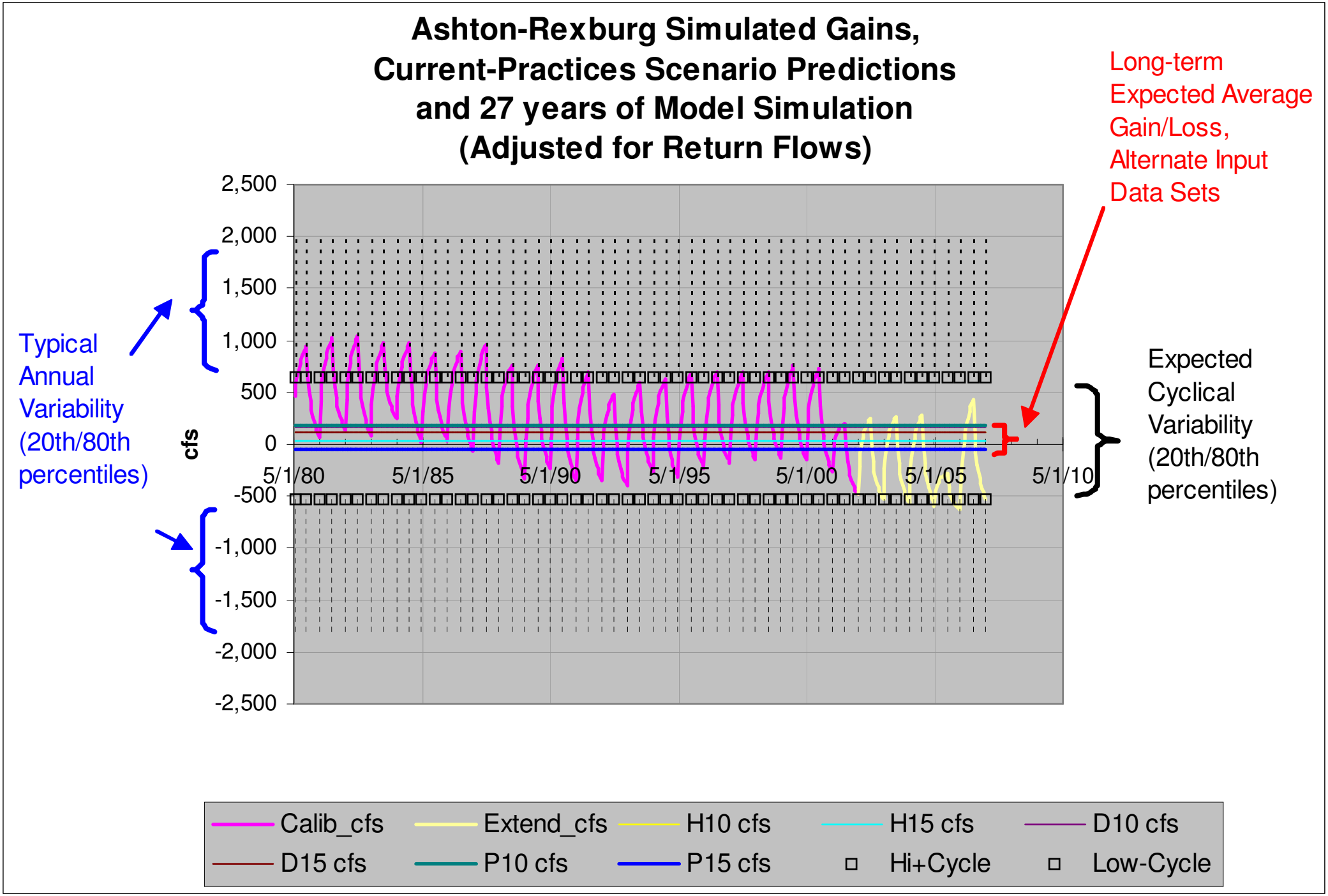
Step 2: 27-year model simulation trend



Step 3: Add scenario ***long term*** results



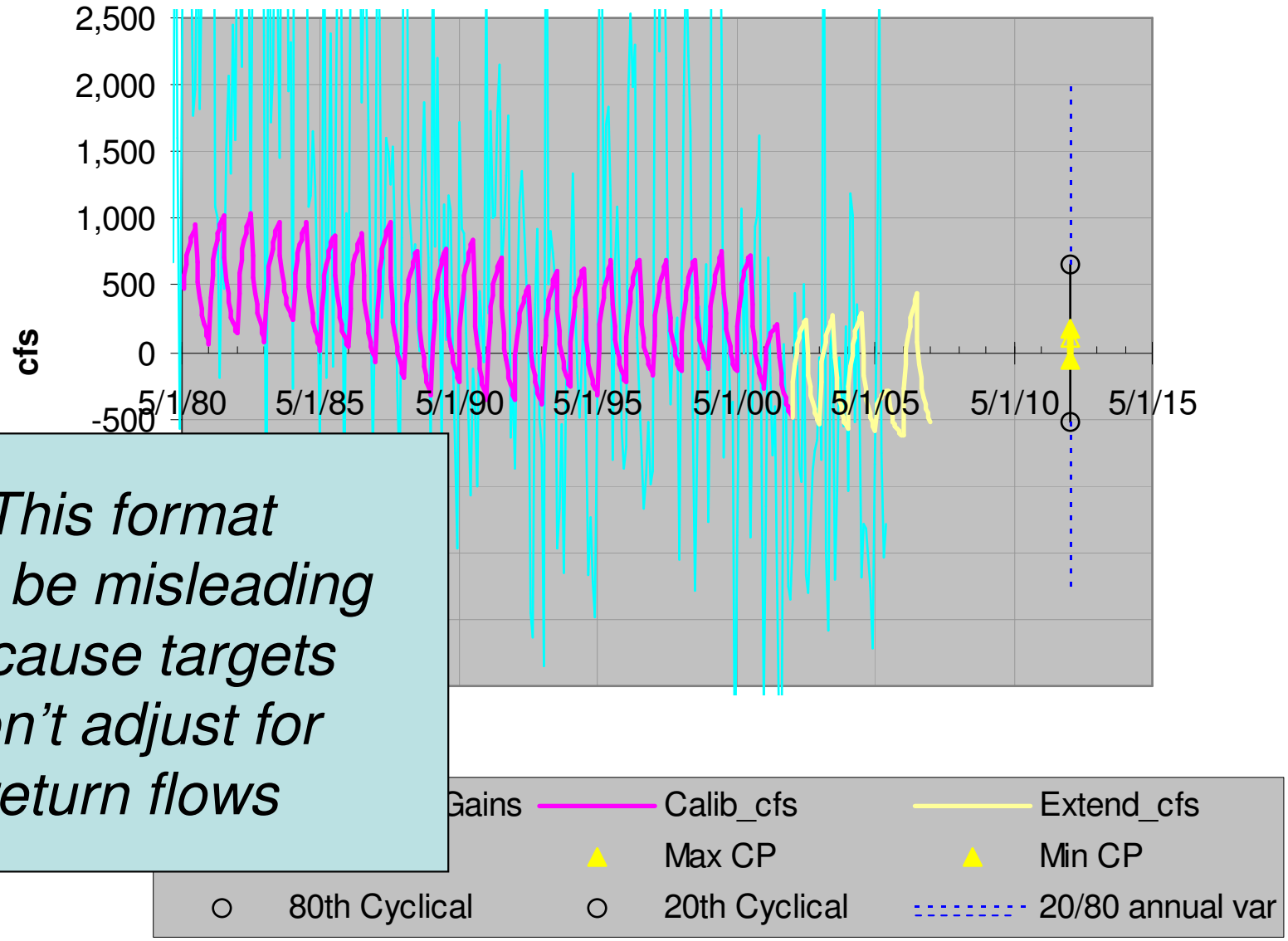
Step 4: Add expected bounds of ***cyclical swings***



Step 5: Add expected bounds of ***seasonal fluctuation***

Alternate presentation

Ashton-Rexburg Simulated Gains, 27 years of Model Simulation and Current Practices Ending Condition (Adjusted for Return Flows) with Measured Gains (Not Adjusted for Return Flows)



This format may be misleading because targets don't adjust for return flows

(End)